Louisiana Department of Health and Hospitals
Office of Public Health
Center for Environmental Health

Louisiana BEACH Grant Report
2011 Swimming Season

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In Partial Fulfillment of Federal Assistance Agreement Number CU-00F09802-0 for Development of Coastal Recreation Water Monitoring and Public Notification

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In cooperation with Louisiana Department of Health and Hospitals
Office of Public Health, Center for Environmental Health

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EXECUTIVE SUMMARY

This document was prepared to partially fulfill the Louisiana Department of Health and Hospitals, Office of Public Health, Center for Environmental Health Services (CEHS) reporting obligations under U.S. Environmental Protection Agencies (USEPA) BEACH grant program, Federal Assistance Agreement Number CU-00F09802-0. Prior to publication of this report, the document was distributed to USEPA and the Louisiana Department of Environmental Quality for comments. The comments provided by both agencies were incorporated into this report. The report was made available to the public through CEHS's Beach Monitoring Program website (http://new.dhh.louisiana.gov/index.cfm/page/288).

As documented in *Louisiana's BEACH Grant Final Report – Grant Year 2001* (LDHH 2003; the Beach Report) and *Louisiana's Beach Program Quality Assurance Project Plan* (QAPP; LDHH 2011), CEHS is to submit an annual technical report to USEPA after the end of the recreational period that summarizes the number of beaches monitored in each Tier, lists any additional beaches to be added to the Program or Tier reassignments to be made in the next year, presents a compilation of sampling results, and summarizes assessment activities and response actions. The report is to also include for Tier 1 and 2 beaches, the number of beach monitoring stations for which advisories were issued, the number of times water quality criteria were exceeded and the number of days under advisories for each beach monitoring station. This report satisfies the reporting obligations set forth in the Beach Report and outlined above.

Lingering impacts from hurricanes Katrina, Rita (August and September 2005, respectively), and Gustav and Ike (September 2008) continued to impact the Program in 2011. Use of Cameron Parish Beaches remained below pre-storm levels, although it continues to recover as the area rebuilds, and Hackberry Beach remained inaccessible due to road damage. Additionally, access constraints due to an ownership dispute on portions of Fourchon Beach restricted public access to the beach area during 2011, and as a result, stations FOUR2–FOUR4 were not monitored during 2011. Use at the remaining beaches during 2011 was near historic levels.

Between 4 April 2011 and 31 October 2011, a total of 850 samples were collected at 25 sample stations. Monitoring was initiated and conducted on schedule from the start of the monitoring season (1 April) through the end of the season (31 October). Twenty-four (24) sample stations were monitored at ten Tier 1 or 2 continuous beach segments with a total of 62 advisories issued. Advisories were issued at 22 of the 24 sample stations during 2011 based on observed water quality exceedances. There were no advisories issued at Fourchon Beach (FOUR1) or Grand Isle State Park's west most station (GISP4). Compliance at stations with advisories varied between 85% of monitored days in compliance at GIB1 and GIB2, to a low of 7% for GBRZ1. Across all monitored sample stations, 46% (2,037 of 4,392) of the 2011 swimming season's available station-days were in compliance and not under an advisory. No beach closures were issued in 2011.

Similar to most prior years, all advisories issued in 2011 resulted from exceedances of enterococci criteria, with exceedance of the geometric mean criterion involved in 97% of advisory days. Forty-seven percent (47%) of those noncompliance days resulted from enterococci geometric mean exceedances only, and 49% resulted from both enterococci

geometric mean and single sample maximum exceedances. Only 3% of the 354 observed exceedances were the result of exceeding the single sample criterion alone. As discussed in previous Louisiana BEACH Grant reports, Louisiana's percentage of monitored station-days that were in compliance is not directly comparable with other states that do not use equivalent decision criteria. If Louisiana's decision rule were based only on the enterococci single sample maximum criterion, the state would have reduced noncompliance during 2011 by 47%.

With each water sample collected by the BEACH Program, environmental variables were also collected. Using those data collected by the Program from 2004 through 2009, CEHS performed a thorough statistical analysis to examine how indicator organism density was influenced by environmental factors at Louisiana's coastal beaches (the 2009 analysis presented in the *Louisiana BEACH Grant Report, 2009 Swimming Season*). Consistent with previously reported analyses, the results of the 2009 analysis confirmed the following:

- There were no statistically meaningful differences among sample stations within continuous beach segments;
- Enterococci densities have changed from year-to-year at all beach segments except FOUR;
- There were no known controllable sources influencing the high enterococci densities at Cameron beaches;
- Environmental variables explained only a small fraction of the total variability in indicator organism density, and thus, statistical models of environmental variable-indicator organism relationships were not sufficient to be used as predictive models upon which precautionary advisories could be based.

Louisiana beaches are somewhat different from those of most coastal states in that they represent a wide range of salinity conditions and most are relatively remote from urban runoff, reducing the direct association between environmental conditions and enterococci densities. Given the water quality and environmental data collected by the Program through 2009, Louisiana BEACH Program managers believed development of models that could reliably predict enterococci densities were unlikely to be developed for Louisiana's beaches. However, a reexamination of the association between the available environmental variables and enterococci density was performed following the 2011 beach monitoring season because a significant amount of new data had been collected through the 2011 season. Using data collected through 2011, the analysis yielded the same conclusions as were drawn following the 2009 analysis. That is, year-to-year differences in enterococci density at all beach segments other than FOUR was a significant source of variation, and that for most beach segments, the relationship between the environmental variables and enterococci density changed from year to year. Additionally, the observed year-to-year variation in enterococci density was not explained by corresponding differences in the environmental variables.

Because of large year to year differences in enterococci densities and associated annual variance within all beach segments except for Fourchon Beach, and annual differences in the relationship between enterococci density and the environmental variables, developing useful statistical model that go beyond finding a general pattern of environmental conditions that are associated with higher/lower enterococci densities is not possible for Louisiana's more remote beaches. The

only possible exceptions are the urban Lake Charles area beaches; the only urban beach segments currently monitored under Louisiana's BEACH Program. For the remote beaches or those removed from major population centers, the relationship between environmental factors and enterococci density is complex and will take more investigation to understand, requiring targeted studies that are not funded under current Beach Grants.

Development of useful predictive models may be possible for the Lake Charles area beaches, but additional data are required to better determine the extent of annual variation in enterococci density to determine if that variation can be adequately modeled as a random effect. Based on data collected through 2011, enterococci density appears to be highly influenced by annual differences not accounted for in the observed environmental variables, but generally increases with increasing precipitation, calm or high winds, and increasing salinity at a given water temperature, or increasing water temperature with high salinities but decreases with increasing water temperature with low salinities (significant temperature-salinity interaction). Assuming that a suitable predictive model can be developed in the future, sources for local salinity and water temperature data would need to be identified and the models calibrated to data from those sources for the models to have administrative value.

Based on a year-end audit and data review, all data quality precision and completeness goals were achieved for 2011. The only inconsistency between program operations and the Program's QAPP guidelines during 2011 was the recordation of enterococci results that were reported by the laboratory as less than detection limits. The QAPP requires that an enterococci density of five (5) be recorded in the Program's database for all samples with an enterococci density below the test's detection limits, but in 2011 a density of 10 was recorded for those samples. The impact of that variance was minimal, and erred toward protection of public health. The BEACH Program Manager/Quality Assurance Officer will reinforce the need for adherence with the QAPP, including proper data recordation prior to the start of the 2012 sampling period. All monitoring and notification data collected during 2011 have been uploaded to the appropriate USEPA data storage systems.

In preparation for the 2012 Beach monitoring season, the Program reassessed risk levels at monitored beaches and determined if any additional beaches warranted monitoring. Risk is a function of historic water quality conditions based on past Program sampling and beach use. Based on observed use levels and patterns during the 2011 swimming season and projections of use for the 2012 swimming season by Program partners, it is anticipated that use levels and patterns will remain at or return to approximately historic levels for all beaches except for the Cameron Parish and Fourchon Beaches. Cameron Parish beaches are expected to continue to operate below pre-hurricane Rita levels, and Hackberry beach use is expected to remain limited during 2012 due to the continuing absence of adequate road access. Public access to Fourchon Beach is expected to remain restricted until the landownership dispute that restricted access during 2011 is resolved or other arrangements to restore public access are negotiated. Regardless of whether or not public access was to be restored, Fourchon Beach is expected to remain closed to the public during 2012 due to beach enrichment construction activities scheduled to occur during the 2012 swimming season.

The only additional beach segment identified for monitoring in 2012 was Elmer's Island, which is located between Fourchon and Grand Isle Beaches. Elmer's Island was considered for inclusion in the Program when the Louisiana BEACH Program was established in 2003, but was not included at that time because the beach was privately owned and accessible to the public by boat only. In mid-December 2008, the state found that the beachfront portion of the island is the property of the State of Louisiana, and restored public road access to the island for the 2009 Fourth of July weekend. Beach use during the 2011 swimming season was reported to be moderate to high, and is expected to remain so during 2012 due to improved beach access and a shift of use from Fourchon Beach to Elmer's Island. The contiguous beach was divided into two beach segments to accommodate different levels of use between the eastern and western sections of the beach. The Elmer's Island segment begins at the west most end of the segment at the point of highest use at the end of the access road and extends approximately 0.31 miles east, and the Elmer's Island-East segment continues approximately 2 miles around the end of the island. Two sample stations were established; ELMR1 and ELMR2 for Elmer's Island and Elmer's Island-East beach segments, respectively. Similar to the Fourchon Beach-West beach segment, use at Elmer's Island-East, away from the access point, is expected to be low.

The anticipated use and historic water quality risk levels resulted in the 2012 monitoring season classification of seven beach segments as Tier 1 beaches (Fontainebleau, Elmer's Island, Grand Isle and Cypremort Point State Parks, Holly, and North and South Beaches), and three beach segments as Tier 2 (Grand Isle Beach, the Constance Beach Complex, and Hackberry and Rutherford Beaches), and three Tier 3 beach segments. Of the three Tier 3 beach segments, only Fourchon Beach [Four1] will be monitored (Elmer's Island East [ELMR2], and Fourchon Beaches FOUR2-3 and FOUR4 are not anticipated to be monitored during 2012). In 2012, it is anticipated that the Program will monitor 6.0 beach miles as Tier 1 beaches, 14.0 miles as Tier 2 beaches, and 0.3 miles of Tier 3 beach.

CHAPTER 1. Purpose, Background and 2011 Program Accomplishments

Purpose

According to *Louisiana's BEACH Grant Final Report – Grant Year 2001* (the Beach Report; LDHH 2003) and *Louisiana's Beach Program Quality Assurance Project Plan* (QAPP; LDHH 2011), the Louisiana Department of Health and Hospitals (LDHH), Office of Public Health (OPH), Center for Environmental Health Services (CEHS) is to submit an annual technical report to U.S. Environmental Protection Agency (USEPA) after the end of the recreational period. The report should accomplish the following: summarize the number of beaches monitored in each Tier, list any additional beaches to be added to the Program or Tier reassignments to be made in the coming year, provide a compilation of the sampling results, and summarize assessment activities and response actions. This report serves as the annual technical report for the 2011 recreational period and satisfies all of the requirements described above.

This document consists of four chapters. In this chapter, 2011 Program accomplishments are summarized. Chapter 2 contains a summary of the number of beaches that were monitored in each Tier, and a description of updates to Louisiana's BEACH Program, as anticipated under the Beach Report. Louisiana's BEACH Program updates include descriptions of 2011 Program modifications, and changes to Tier assignments and beaches to be monitored under the Program in 2012. In Chapter 3, monitoring and response efforts and results for 2011 are provided. Data quality assessment results for the 2011 swimming season are presented in Chapter 4. Appendices A, B, and C contain station names and USEPA IDs, time series analyses of water quality data, and sample results, respectively. Appendix D provides a summary of how Louisiana's BEACH Program has fulfilled the original BEACH Grant requirements.

Background

In many ways, water could be considered Louisiana's greatest natural resource. Louisiana's vast estuarine basins provide a unique playground for swimming, wading, boating, fishing, and other aquatic activities. However, swimming in waters with high bacteria densities from fecal sources are a known threat to public health, causing elevated rates of gastrointestinal illness. LDEQ has historically conducted routine ambient monitoring of state coastal waters designated for primary contact recreation and utilized fecal coliform criteria to assess attainment of ambient water quality standards for swimming uses. However, there were no mechanisms in place to routinely sample water quality at "high-use" swimming waters, which had not been designated in state regulations by LDEQ, or to provide the public with the results of risk-based analyses that allow for an informed decision prior to swimming in selected coastal recreation waters.

In response to growing concern about public health risks posed by polluted bathing beaches, the U.S. Congress passed the BEACH Act in 2000. In 2001 the USEPA, under the provisions of the BEACH Act, made grant funds available to the OPH for the development of a monitoring and notification program for high-use coastal recreation sites, referred to as Louisiana's BEACH Program. Since initial grants were awarded, Louisiana's BEACH Program has been developed and successfully implemented under the guidance of the CEHS.

Consistent with USEPA's guidance, Louisiana's BEACH Program consists of two primary activities, monitoring and notification. Since bacteriological contaminants cannot be effectively monitored directly, monitoring for fecal contamination of surface waters requires the identification of indicator organisms that are associated with fecal contamination and readily monitored using available technologies. Like most other states, Louisiana has historically used fecal coliform densities as the indicator of bacteriological contamination of surface waters. However, under the terms of BEACH grant awards, states are required to base decisions about marine water quality at sites monitored using BEACH grant funds on enterococci bacteria densities. Enterococci has recently become generally accepted by the scientific community as more closely associated with rates of gastrointestinal illness in marine environments than fecal coliform densities, and thus USEPA believes that the use of enterococci may serve to better protect the public health in marine environments. However, because Title 51 Part XXIV of the Louisiana State Administrative Code stipulates the use of fecal coliform, Louisiana's BEACH Program chose to incorporate standards for both indicator organisms into its decision rule. The use of fecal coliform and enterococci as dual indicators of potential bacteriological contamination allows CEHS to better evaluate the presence of possible pathogens in Louisiana's unique coastal environment.

The second primary activity under the Program is public notification. Louisiana's BEACH Program issues public health advisories at Tier 1 and 2 monitored sites (tiers are defined in Chapter 2) when water quality samples are found to exceed the enterococci/fecal coliform criteria. The criteria used are a single sample maximum of 104 for enterococci, and steady state criteria based on geometric means of 35 for enterococci and 200 for fecal coliforms (quantities expressed as MPN/100 ml). The advisories urge users to abstain from swimming, but do not officially "close" the water body to recreational use. The Program disseminates swim advisories by press release, website postings, and by opening pole-mounted signs which are installed at the beach monitoring sites. When water quality sample results indicate that bacteria levels at beach sites under swim advisories are once again compliant with the decision rule, the public is notified that the advisory has been lifted through beach signage, press releases, and the website (http://new.dhh.louisiana.gov/index.cfm/page/288).

Program Accomplishments During 2011

Lingering impacts from hurricanes Katrina and Rita (August and September 2005, respectively), as well as hurricanes Gustav and Ike (September 2008) continued to affect some beaches monitored by the Program in 2011. Use of Cameron Parish Beaches (Constance Beach Complex, Hackberry and Rutherford Beaches, and Holly Beach) remained below pre-storm levels in 2011, although use continues to increase as the area is rebuilt, and Hackberry Beach remained inaccessible due to road damage. Access constraints due to an ownership dispute on portions of Fourchon Beach restricted public access to the beach area during 2011, and as a result, stations FOUR2–FOUR4 were not monitored during 2011, as discussed in Chapter 2.

During 2011, Louisiana's BEACH Program:

1. Monitored all accessible sample sites designated for monitoring in accordance with the requirements of their tier assignment throughout the swimming season; and

2. Continued to meet or exceed the majority of the quality assurance/quality control goals established in the Program's QAPP.

CHAPTER 2 - Update Of BEACH Program

Review of Beach Rankings

In 2003, the CEHS completed a systematic process to identify and rank Louisiana's beaches according to risk. The process consisted of the following steps (LDHH 2003):

1. Identification and definition of coastal recreation waters;
2. Identification of beaches or similar points of access used by the public for swimming, bathing, surfing, or similar water contact activities;
3. Review of available information on levels of potential fecal contamination at beaches and intensity of beach use; and
4. Ranking of beaches to decide which beaches would be included in Louisiana's BEACH Program.

Based on levels of beach use and perceptions of water quality from estimated fecal coliform densities in adjacent waters, a qualitative ranking scheme was devised and used to assign each beach to an appropriate monitoring tier. The monitoring tiers provide different levels of monitoring and public notification so that beaches with a greater density of swimmers, and thus the greatest number of people at risk, receive higher levels of monitoring and public notification than lower use beaches. Monitoring and public notification procedures are exactly the same at Tier 1 and Tier 2 beaches, but differ in density of sample stations. Sample stations are closer together at Tier 1 beaches, no more than 500 meters apart, than at Tier 2 beaches, where samples stations are no more than 2 miles apart on continuous beach segments. Sample stations at Tier 3 beaches are at the same density as Tier 2 beaches, but samples are not collected weekly, and accordingly, weekly public advisories are not issued for Tier 3 beaches.

The estimated number of swimmers at each beach was based on information obtained primarily from law enforcement officials responsible for patrolling the beach and from park managers. The officials provided estimates of the number of beach visitors on a typical weekday, weekend, and holiday during the peak swimming season, May 1 through Labor Day, along with an estimate of the percentage of beach users entering the water. These estimates were combined by adding typical weekday and weekend use to provide an estimate of weekly use. Weekly use was multiplied by the number of weeks in the recreational period, and added to the estimated number of holiday visitors during Memorial Day, Fourth of July, Labor Day, and any other beach-specific major events. Because the resulting total was an estimate of unknown precision, those estimates were generalized into broad categories of use for relative comparison as follows:

Category of Use	Estimated Number of Swimmers
Very Low	<5,000
Low	5,000 to <10,000
Moderate	10,000 to <15,000
High	15,000 to 20,000
Very High	>20,000

Because beach water quality was either inferred from the water quality of the surrounding area as a whole, or based on a short period of data, and no studies were available providing a model of the relationship between fecal coliform concentrations and illness rates, the qualitative ranking process relied primarily on beach use. Beaches classified as having very high, high, or moderate to high use were assigned to Tier 1 and receive the most monitoring attention. Beaches classified as having moderate use were assigned to Tier 2. Beaches with low or very low use were assigned to Tier 3 and targeted for additional bacterial indicator monitoring to better characterize risk. Beaches on private land or with existing swimming advisories posted by the State, and with very low public use were excluded from further consideration. A total of 29.16 miles of beach were considered for monitoring under Louisiana's BEACH Program, of which 23 miles have been assigned to a monitoring tier (LDHH 2003).

CEHS anticipated that beach use and water quality could change through time, and planned to re-evaluate beach rankings on an annual basis at the end of each swimming season (LDHH 2003). In 2006, it was decided that the Program would continue to evaluate risk primarily on the estimated density of swimmers at a beach in accordance with the original categories of use described above, but a new method of assessing water quality risk was developed. The original assessment evaluated water quality based on estimated fecal coliform densities. Data collected during 2004 and 2005 provided new information about water quality, including enterococci densities, which were not previously available. Because USEPA's chosen indicator organism for marine waters is enterococci, and because greater than 99.8% of all swim advisories issued to date have involved exceedance of enterococci criteria, new water quality categories based on enterococci densities were developed for use in the risk-based Tier assignment process.

A sample station's enterococci geometric mean density was strongly correlated with the percentage of monitored weeks under an advisory, so a sample station's geometric mean is a good indicator of the likelihood of exceeding the established limits of acceptable risk. Accordingly, water quality risk categories were based on the ratio of a beach's enterococci geometric mean divided by the enterococci geometric mean decision criterion of 35 MPN/100 ml. Water quality risk categories were established as: "Lower Risk", if the beach's geometric mean/35 < 0.5; "Moderate Risk" if the beach's geometric mean/35 ≥ 0.5 and < 1; and "Higher Risk" if the beach's geometric mean/35 ≥ 1. Using the revised classification scheme, continuous beach segments were assigned to Tiers at the beginning of 2011. Table 1 identifies the beaches that were monitored under the Program during 2011, their designated 2011 monitoring Tier, and associated sample stations.

Beach use during 2011 remained reduced compared to historic norms at some beaches as they continue to rebound from past hurricanes, and due to access constraints. Use remained low relative to historic levels at Cameron Parish beaches as the area continues to rebuild following Hurricanes Rita and Ike. Hackberry Beach (HACK1) in Cameron Parish, rendered inaccessible due to road damage by Hurricane Ike, remained inaccessible through the 2011 swim season. Public access to Fourchon Beach was restricted by a dispute over land ownership, with the ostensible private landowner denying public access to the beach area beyond the end of the public road. Lingering cleanup activities to remove periodic oil contamination from the 2010 Deepwater Horizon accident also complicated access to Fourchon Beach. Accordingly, there was no public use of Fourchon Beach in 2011.

Table 1. Continuous beach segments, beach miles, monitoring Tier assignments for 2011 and 2012, and sample stations.

Continuous Beach Segments	Designated Beach Miles	First Year Sampled	2011 Designated Monitoring Tier	2011 Actual Monitoring Tier	2012 Designated Monitoring Tier	Sample Station State IDs*
Lake Pontchartrain Basin Beaches						
Fontainebleau State Park	0.13	2004	1	1	1	FONT1
Barataria River Basin Beaches						
Elmer's Island	0.31	2012	NA	NA	1	ELMR1
Elmer's Island-East	1.92	2012	NA	NA	3	ELMR2
Grand Isle State Park	1.03	2004	1	1	1	GISP1-4
Grand Isle Beach	6.20	2005	2	2	2	GIB1-3
Fourchon	0.88	2005	1	1	3	FOUR1-3
Fourchon-West	1.59	2005	3	3	3	FOUR4
Vermilion-Teche River Basin Beaches						
Cypremort Point State Park	0.47	2004	1	1	1	CYPT1
Calcasieu River Basin - Lake Charles Beaches						
North Beach - Lake Charles	0.42	2009	1	1	1	LCNB1
South Beach & Rabbit Island	0.23	2009	1	1	1	LCSB1
Calcasieu River Basin - Cameron Beaches						
Holly Beach	3.44	2005	1	1	1	HOLLY1-6
Mermentau River Basin Beaches						
Hackberry Beach and Rutherford Beach	2.40	2005	2	2	2	HACK1, RUTH1
Sabine River Basin Beaches						
Constance Beach Complex (CNSTBC)	6.29	2005	2	2	2	CNST1, DUNG1, GBRZ1, LTFL1, MART1

Note: * Sample station names and USEPA IDs are provided in Appendix A.

During 2011, seven continuous beach segments were designated as Tier 1 beaches and scheduled for monitoring (Grand Isle, Cypremort Point, and Fontainebleau State Parks; Fourchon and Holly Beach, and North and South Beaches in Lake Charles), and three continuous beach segments were designated as Tier 2 (Grand Isle Beach, Hackberry and Rutherford Beaches, and the Constance Beach Complex). Fourchon-West was scheduled to be monitored as a Tier 3 beach. All beach segments were monitored at their designated tier level during 2011 except for Fourchon, Fourchon-West and Hackberry and Rutherford Beaches. Sample stations FOUR2 and FOUR3, FOUR4 and HACK1 were not monitored as scheduled due to access constraints described above. Pontchartrain Beach continued to be monitored as a calibration site again in 2011 to gather data to reexamine the swim advisory on that portion of Lake Pontchartrain.

In summary, during 2011, the Program monitored 6.0 of the 6.6 Tier 1 beach miles at the seven continuous Tier 1 beach segments, including sampling and public notification at 15 of the 17 Tier 1 sample stations (Table 2). Two Tier 1 sample stations (FOUR2 and FOUR3) were not

monitored in 2011 due to access constraints. Three continuous beach segments totaling 14.9 miles were designated as Tier 2 beaches, of which 14.0 miles were monitored including sampling and public notification at 9 of the 10 sample stations (HACK1 was not monitored due to ongoing access constraints). Fourchon-West, the only Tier 3 beach segment (1.6-miles) was also not monitored due to access constraints.

Table 2. Number of continuous beach segments, sample stations, and beach miles monitored by Tier during 2011 and planned for 2012.

	2011 (Actual)			2012 (Projected)		
	Tier 1	**Tier 2**	**Tier 3**	**Tier 1**	**Tier 2**	**Tier 3**
Number of Continuous Beach Segments	7	3	1	7	3	3
Number of Sample Stations	17	10	1	15	10	5
Total Beach Miles	6.6	14.9	1.6	6.0	14.9	4.4
Number of Continuous Beach Segments Monitored	7	3	0	7	3	1
Number of Sample Stations Monitored	15	9	0	15	9	1
Total Beach Miles Monitored	6.0	14.0	0	6.0	14.0	0.3

For the 2012 swimming season, as in past years, monitoring tier assignments were reviewed for all beaches based on expected use levels and historic water quality. It is anticipated that use levels and patterns will remain at or return to approximately historic levels for all beaches except for the Cameron Parish and Fourchon beaches. Cameron Parish beaches are expected to continue to operate below pre-hurricane Rita levels, and Hackberry Beach use is expected to remain limited during 2012 due to continuing access constraints. Public access to the Fourchon and Fourchon-West beach segments is expected to remain restricted until the landownership issue is resolved or other arrangements to restore public access are negotiated. Regardless of whether or not public access was to be restored, both Fourchon beach segments are expected to remain closed to the public during 2012 due to beach enrichment construction activities scheduled to occur during the 2012 swimming season.

Using 2011 water quality data pooled across sample stations within continuous beach segments, water quality risk categories were calculated for each continuous beach segment for use in establishing 2012 Tier assignments (Table 3). For this analysis, sample station results for the Fourchon and Fourchon-West segments (i.e., FOUR1–FOUR4) were pooled and considered one continuous beach segment (Fourchon Beach). Using the water quality results, one continuous beach segment was classified in the lower water quality risk category (Fourchon Beach), two in the moderate risk category (Grand Isle and Grand Isle State Park), and seven in the higher risk category (Constance Beach Complex, Cypremort Point, Fontainebleau, Hackberry and Rutherford Beaches, Holly Beach, and North and South Beaches in Lake Charles). Figure 1.A shows the strong inverse linear relationship (R-Squared = 0.78, $P < 0.001$) between the enterococci geometric mean / 35 criterion and the percent of monitored days with no advisories, or inversely, how the likelihood of an advisory increases within higher water quality risk categories.

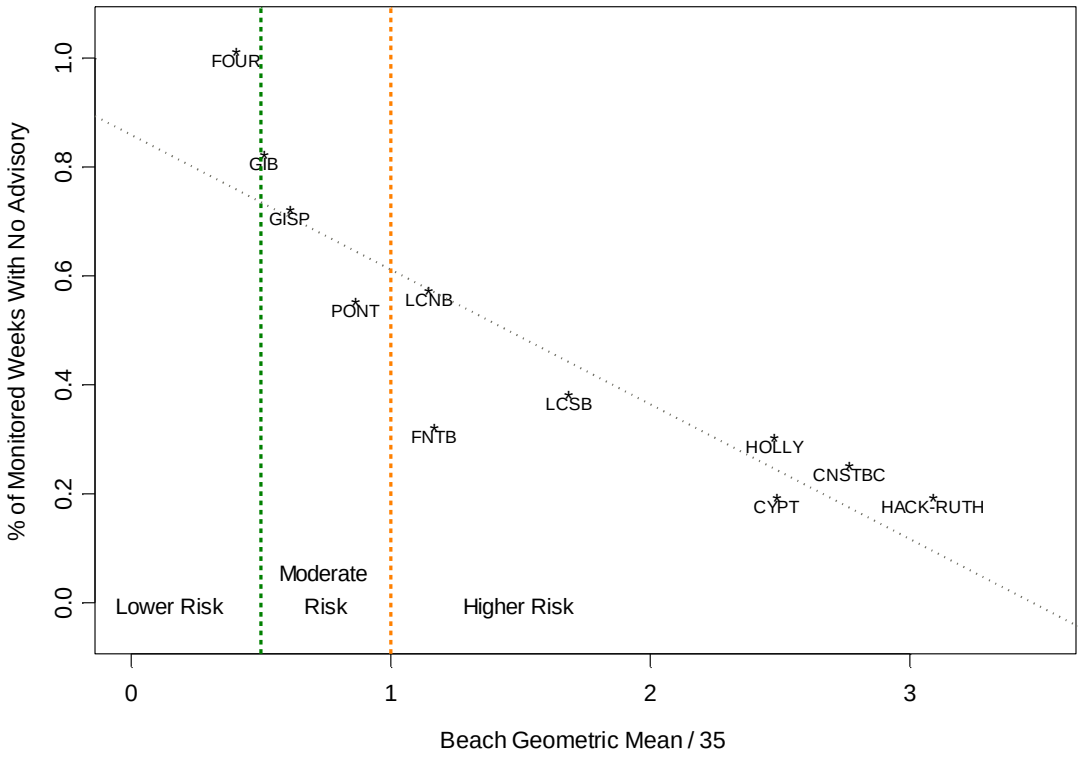
Table 3. Beach water quality and use risk categories for 2012 swimming season based on anticipated use in 2012 and 2011 water quality data.

Beach	Anticipated 2011 Use	2011 Entero. Geometric Mean	2011 Entero. Geometric Mean / 35	2011 Water Quality Risk Cat.	Entero. 95th Parametric Percentile 2009-2011	WHO Risk Category
CNSTBC	Low	96.9	277%	Higher	1,765	D
CYPT	Mod.-High	87.1	249%	Higher	2,119	D
FNTB	High	40.9	117%	Higher	419	C
FOUR[1]	Very Low	14.2	40%	Lower	124	B
GIB	Moderate	18.0	51%	Moderate	92	B
GISP	Very High	21.4	61%	Moderate	158	B
HACK-RUTH	Very Low	108.1	309%	Higher	1,385	D
HOLLY	Mod.-High	86.7	248%	Higher	1,463	D
LCNB	Very High	40.1	114%	Higher	392	C
LCSB	Very High	59.0	168%	Higher	989	D
PONT[2]	Very Low	30.2	86%	Moderate	283	C

Notes: [1] For purposes of water quality evaluation sample station results were pooled across the Fourchon and Fourchon-West continuous beach segments;[2]PONT is not currently a BEACH Act beach but is being sampled to obtain data to evaluate the long-standing swim advisory affecting the site.

For comparison with the Louisiana BEACH Program's beach risk classification, the World Health Organization's (WHO) microbial water quality assessment criterion (WHO 2003) was applied to the last three years (2009–2011) of Louisiana's water quality data. Those results are provided in Table 3. In previous years, water quality data from all available years was used to determine the WHO classification for each beach, but due to a trend in enterococci density at most beaches, only the last three years was used in this report. In addition to water quality, the WHO classification system also uses sanitary inspection categories to classify waters from very good to very poor, depending on the beach's susceptibility to fecal influence as determined by a sanitary survey, but only the microbial criterion was evaluated for this comparison. Rather than rely on the geometric mean for its microbial criterion, the WHO uses the 95th percentile of observed indicator organism densities because it is easily understood and reflects much of the top-end variability in the distribution of water quality data that are of greatest public health concern. The WHO classifies water quality into four categories based on the risk of acquiring gastrointestinal illness as follows: A) <1 case in 100 exposures, 95th percentile ≤40; B) between1 and 5 cases in 100 exposures, 95th percentile 41-200; C) between 5 and 10 cases in 100 exposures, 95th percentile 201-500; and D) >10 cases in 100 exposures, 95th percentile >500. For comparison, the USEPA's accepted gastrointestinal illness rate for marine recreational waters is 19 illnesses per 1,000 swimmers, which would place it in WHO category B.

A.



B.

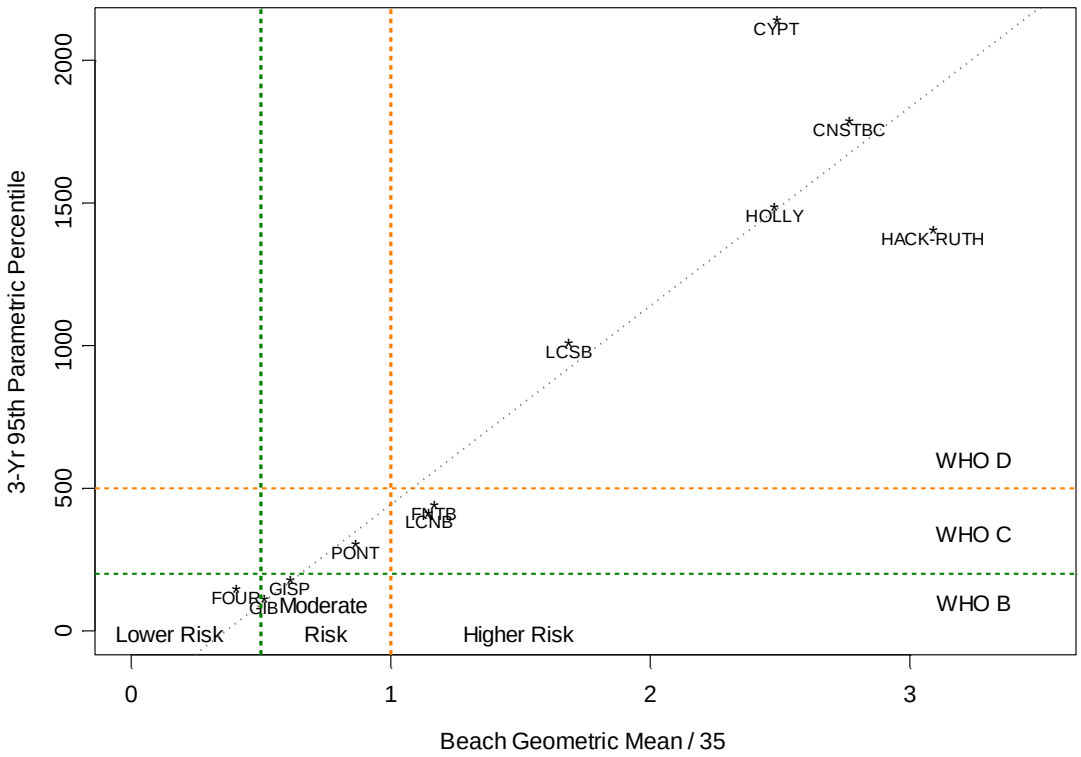


Figure 1. A. Louisiana's water quality risk categories based on a continuous beach segment's enterococci geometric mean/35 and percent of monitored weeks without an advisory for 2011. B. Relationship between Louisiana's (2011 data) and WHO risk categories (2009-2011 data).

Applying the WHO classification to the last three years' data (2009–2011), Louisiana has: no very good to good (WHO cat. A) continuous beach segments; three good to fair (WHO cat. B) beach segments (Grand Isle State Park, Grand Isle, and Fourchon Beaches); two fair to poor (WHO cat. C) beach segments (Fontainebleau State Park and North Beach in Lake Charles); and five poor to very poor (WHO cat. D) beach segments (Constance Beach Complex, Cypremort Point State Park, Hackberry and Rutherford Beaches, Holly Beach, and South Beach in Lake Charles). A graphical comparison of Louisiana's and the WHO's classifications suggest that Louisiana's Lower, Moderate and Higher risk categories match closely to the WHO's B, C and D, respectively (Figure 1.B). Pontchartrain Beach, if designated as a Louisiana BEACH Program beach, would be ranked as a Moderate risk beach under the Louisiana system, and as a category C under the WHO system.

Combined 2011 use and water quality rankings for each continuous beach segment are given in Table 4. As discussed above, tier categories remain based on the same swimmer density categories that were used in the original tier designation system, but low and very low use categories are designated as "Discretionary". For "Discretionary" beach segments, the Louisiana BEACH Program Manager will decide if Tier 2 or 3 level monitoring is warranted at any time during the monitoring season. Because of the higher water quality risk at Constance Beach Complex and Hackberry and Rutherford Beaches, it is anticipated that they will remain Tier 2 beaches during 2012. The 2011 beach tier assignments are expected to remain in place for 2012 as shown in Table 1, except that the Fourchon beach segment (FOUR1–FOUR3) has been assigned to Tier 3 due to public access restrictions, with only FOUR1 anticipated to be sampled once per month (FOUR2–FOUR4 are not anticipated to be sampled in 2012). Elmer's Island will be added to the Program in 2012 as described below, with the use and water quality anticipated to be comparable to historical levels at Fourchon Beach. Therefore, the Program is expected to monitor 6.0 beach miles as Tier 1 beaches, 14.0 of 14.9 miles of Tier 2 beach, and 0.3 of 4.4 miles of Tier 3 beach (Table 2) in 2012.

Table 4. Combined beach use and water quality risk categories for 2012.

Water Quality Risk[1] =►

# of Swimmers =▲	**Lower Risk**	**Moderate Risk**	**Higher Risk**	**Unknown**	
VH		GISP	LCNB, LCSB		**Tier 1**
H	ELMR1[2]		CYPT, FNTB, HOLLY		
M		GIB			**Tier 2**
L			CNSTBC[3]		**Tier3**
VL	ELMR2[2], FOUR1-FOUR3, & FOUR4[4]	PONT[5]	HACK-RUTH[6]		
	Discretionary				

Notes: [1]Water quality risk level based on 2011 data, or inferred from adjacent beaches (ELMR1 and ELMR2). [2]Use at ELMR1 and ELMR2 anticipated to be comparable to FOUR1-FOUR3 and FOUR4, respectively. [3]CNSTBC will be monitored as tier 2 beaches during 2012. [4]Use at Fourchon Beach (FOUR1-FOUR4) during 2012 is expected to be very-low due to public access constraints. [5]PONT is not currently a BEACH Act beach but is being sampled to obtain data to evaluate the long-standing swim advisory affecting the site. [6]HACK-RUTH will be monitored as a tier 2 beach during 2012, although sampling of HACK1 is expected to limited by access constraints.

In addition to annually re-evaluating risk levels and associated tier designations for beach segments monitored during the previous year, the program determines if any additional beaches warrant monitoring. Only one such beach, Elmer's Island, has been identified. Elmer's Island is located between Fourchon and Grand Isle Beaches, and was considered for inclusion in the program when the Louisiana BEACH Program was established (LDHH 2003), but was not included at that time because the beach was privately owned and accessible to the public by boat only. Historically, the island had been accessible by road from Louisiana Hwy. 1 for an entrance fee, but that point of entry was closed in 2000. In mid-December 2008, the state opened 250 acres of Elmer's Island for public use, via boat access, after extensive title research found that the beachfront portion of the island is the property of the State of Louisiana (see Figure 2). On 1 June 2009, the Louisiana Department of Wildlife and Fisheries announced that public road access to the island would be restored for the 2009 Fourth of July weekend, and more than 800 visitors accessed the island over the three-day holiday weekend. The island remained accessible to the public for day-use until oil contamination from the Deepwater Horizon spill terminated public access through early 2011. Beach use during the 2011 swimming season was reported to be moderate to high, and is expected to remain so during 2012 due to improved beach access and a shift of use from Fourchon Beach to Elmer's Island. For the purpose of 2012 tier assignment, water quality at Elmer's Island is anticipated to be comparable to adjacent Fourchon Beach. Two beach segments were established (Figure 3): Elmer's Island at the point of highest use at the end of the access road ad extending approximately 0.31 miles (500 m) east, and Elmer's Island-East continuing approximately 2 miles around the end of the island. Two sample stations were established, ELMR1 and ELMR2, for the Elmer's Island and Elmer's Island-East beach segments, respectively. Similar to the Fourchon Beach-West segment, use at Elmer's Island-East, away from the access point, is expected to be low.

Program Modifications

No modifications were made to the Program's procedures, methods or decision rule during 2011 other than an adjustment of data quality objectives (DQO) for enterococci and fecal coliform measurement precision, and the due date for this annual report. The DQO for "lab" Mean RPDs (relative percent difference) for enterococci and fecal coliform were changed from 30% to 45%. The original goal of 30% was hypothesized and adopted at the beginning of Louisiana's BEACH Program in the absence of area-specific data. The observed field-split results collected by the Program through 2010 (n = 242; enterococci lab mean RPD =44.9 [SE = 2.8,], and fecal coliform mean RPD = 41.8 [SE = 3.0]) better defined the expected precision and thus the DQO was adjusted. Completion of the annual technical report was changed from January to March to provide the Program with sufficient time to prepare the report. These and all changes that were made in prior years to the Program's procedures, methods or decision rule are summarized in *Louisiana's BEACH Program Quality Assurance Project Plan, Version 2.d*, Appendix B, which is available on the World Wide Web at http://new.dhh.louisiana.gov/index.cfm/page/288.

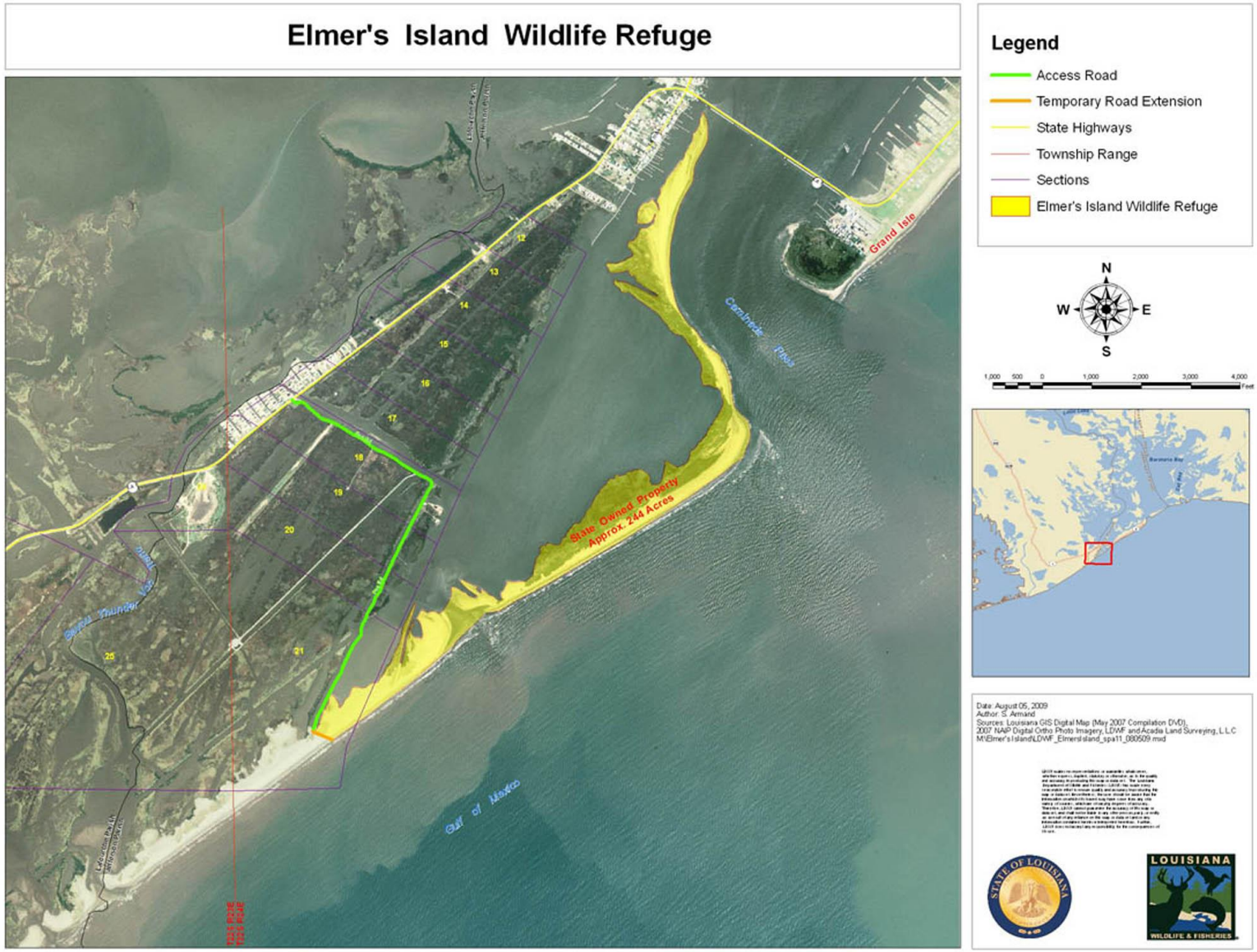


Figure 2. Elmer's Island location map. (Source: Louisiana Department of Wildlife and Fisheries).

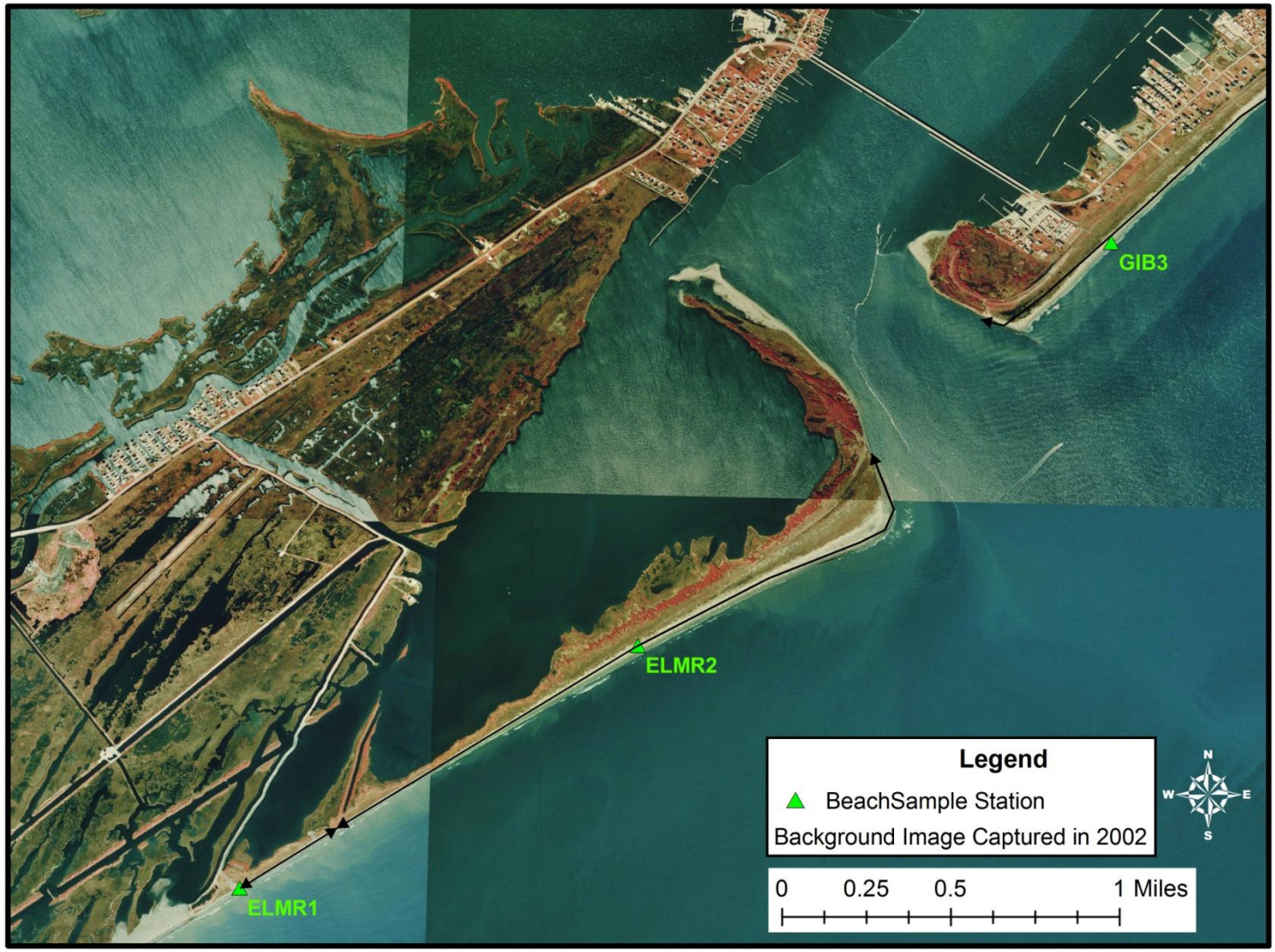


Figure 3. Elmer's Island sample stations and beach segments (solid black line along beach area).

CHAPTER 3. Louisiana BEACH Program's 2011 Results

Number of Samples Collected

Between 4 April 2011 and 31 October 2011, a total of 850 samples were collected at 25 sample stations (see Table 5), distributed among five sample types: calibration, field duplicates and splits, resample, and routine samples. Each type of sampling is described below.

Table 5. Total number of samples collected by sample station and sample type during 2011 by Louisiana's BEACH Program.

	Sample Type					
Sample Station	**Calibration**	**Field Duplicate**	**Field Split**	**Resample**	**Routine**	**Station Total**
CNST1	0	2	0	0	31	**33**
CYPT1	0	1	1	0	31	**33**
DUNG1	0	1	1	0	31	**33**
FNTB1	0	2	0	0	31	**33**
FOUR1	0	2	1	0	31	**34**
FOUR2	0	0	0	0	0	**0**
FOUR3	0	0	0	0	0	**0**
FOUR4	0	0	0	0	0	**0**
GBRZ1	0	3	2	0	31	**36**
GIB1	0	0	1	0	31	**32**
GIB2	0	4	1	0	31	**36**
GIB3	0	5	2	0	31	**38**
GISP1	0	2	2	0	31	**35**
GISP2	0	1	2	0	31	**34**
GISP3	0	1	2	0	31	**34**
GISP4	0	3	1	0	31	**35**
HACK1	0	0	0	0	0	**0**
HOLLY1	0	2	2	0	31	**35**
HOLLY2	0	1	3	0	31	**35**
HOLLY3	0	3	0	0	31	**34**
HOLLY4	0	0	2	0	31	**33**
HOLLY5	0	0	3	0	31	**34**
HOLLY6	0	2	1	0	31	**34**
LCNB1	0	2	1	0	31	**34**
LCSB1	0	2	4	0	30	**36**
LTFL1	0	0	0	0	31	**31**
MART1	0	0	2	0	30	**32**
PONT1	31	2	1	0	0	**34**
RUTH1	0	1	0	0	31	**32**
Sample Type Total	**31**	**42**	**35**	**0**	**742**	**850**

Routine samples are the regularly scheduled weekly samples collected during the designated monitoring period at beaches that are officially part of the Program. A total of 742 routine samples were collected across 24 sample locations monitored in 2011. Calibration samples are samples collected at sample locations that are not officially part of the Louisiana's BEACH Program, in this case, Pontchartrain Beach (PONT1). A total of 31 calibration samples were collected at the PONT1 sample station to gather information for the future reassessment of the long-standing swimming advisory on the south shore of the lake. Resamples are collected at the BEACH Program Manager's discretion when a routine sample has an unexpectedly high indicator organism density or when the source of an exceedance is known and has been corrected and extra samples are required to calculate a post-event geometric mean. There were no resamples collected during 2011.

Field duplicates and field splits are two types of quality control (QC) samples. Field duplicates were used to estimate the precision of sampling methods by comparing laboratory results for two samples taken consecutively on the same day at the same sampling site (i.e., one grab is considered the routine sample or resample and the other the QC sample). Field splits were used to estimate the precision of laboratory analyses (intra-laboratory) plus any variability induced during sample handling and transport by analyzing two aliquots of the same water sample (i.e., one-half of the split sample is considered the routine sample or resample and the other half the QC sample), which were subdivided in the field. Louisiana's BEACH Program QAPP requires that approximately 10% of scheduled sample events be designated as quality control samples, which are selected at random at the beginning of the sampling period in approximately equal proportions (≈ 5% each) of field duplicate and field split samples. QC samples may also be collected during resample events to improve the precision of estimated indicator organism densities by averaging resample and QC sample results. A total of 78 QC samples were scheduled to be collected concurrent with the 742 routine samples and 31 calibration samples that were collected, and were to consist of 43 field duplicates and 35 field split samples. A total of 42 field duplicates and 35 field split samples were collected during 2011. Forty-one (41) field duplicates were sampled as scheduled (98%), and 32 field split samples were collected as scheduled (91%), resulting in 95% of scheduled QC samples collected. One unscheduled field-duplicate and three unscheduled field-split samples were collected, resulting in a total of 42 field duplicate and 35 field split quality control samples collected, achieving 100% of the QC sample goal.

Of the 850 total samples, all were collected during the designated monitoring period, and those collected at Tier 1 and 2 beaches were used to make weekly water quality decisions. For analysis purposes, samples collected on the same date at the same location were not considered independent, and were averaged together resulting in a total of 772 independent samples collected during the 2011 designated monitoring season (see Table 6).

Summary Statistics for 2011 Designated Monitoring Period Samples

Results of fecal coliform and enterococci densities (MPN/100ml) and salinity (parts per thousand; ppt) for each sample location during the 2011 designated monitoring period are summarized in Table 7, and those summaries are depicted graphically in Figures 4 through 6.

Because indicator organism densities are lognormal distributed, Table 7 presents $\log_e$ mean and $\log_e$ standard deviations; exponentiation of the $\log_e$ mean produces the geometric mean on the nominal scale. Note that $\log_e$ fecal coliform and $\log_e$ enterococci medians shown in the graphs and $\log_e$ means in Table 7 are approximately equal as would be expected for lognormal distributed populations.

Figures 4 and 5 show the distribution of $\log_e$ fecal coliform and $\log_e$ enterococci densities (MPN/100ml), respectively, by sample station and relative to the decision criteria for samples collected during the 2011 designated monitoring season. The relationship between fecal coliform and enterococci densities is not examined in this report as a rigorous statistical analysis of that relationship was presented in the *Louisiana BEACH Grant Report, 2007 Swimming Season*. That analysis concluded that although the relationship between fecal coliform and enterococci was positive (higher levels of enterococci are associated with higher levels of fecal coliform), predicting enterococci density from historic fecal coliform data is difficult and imprecise, due in part to the differences in salinity among sample stations as shown in Figure 7.

Table 6. Number of independent samples collected by sample station during the 2011 monitoring season (1 April – 31 October). Samples collected at the same station on the same day are counted as a single sample.

Sample Station	Number of Samples
CNST1	31
CYPT1	31
DUNG1	31
FNTB1	31
FOUR1	31
GBRZ1	31
GIB1	31
GIB2	31
GIB3	31
GISP1	31
GISP2	31
GISP3	31
GISP4	31
HOLLY1	31
HOLLY2	31
HOLLY3	31
HOLLY4	31
HOLLY5	31
HOLLY6	31
LCNB1	30
LCSB1	30
LTFL1	31
MART1	30
PONT1	31
RUTH1	31
Totals	772

Table 7. Summary statistics for fecal coliform and enterococci density (MPN/100ml), and salinity for samples collected during the 2011 designated monitoring season by sample station.

	Fecal Coliform			Enterococci			Salinity (ppt)		
State ID	Geo. Mean	Log_e Mean	Log_e St. Dev.	Geo. Mean	Log_e Mean	Log_e St. Dev.	Mean	St. Dev	n
CNST1	4.20	1.43	0.93	95.77	4.56	1.68	26.74	7.56	31
CYPT1	9.13	2.21	1.29	87.07	4.47	1.72	4.93	3.97	31
DUNG1	2.84	1.04	0.63	85.25	4.45	1.81	27.01	7.08	31
FNTB1	29.84	3.40	1.10	40.87	3.71	1.68	2.94	2.10	31
FOUR1	4.42	1.49	1.02	14.15	2.65	0.66	25.27	5.53	31
GBRZ1	4.16	1.43	1.02	117.36	4.77	1.64	26.87	7.20	31
GIB1	6.50	1.87	1.47	17.31	2.85	0.92	21.45	6.19	31
GIB2	7.57	2.02	1.48	16.80	2.82	0.88	21.52	6.13	31
GIB3	8.05	2.09	1.43	19.95	2.99	1.20	21.66	6.23	31
GISP1	15.18	2.72	1.73	22.12	3.10	0.99	19.64	6.48	31
GISP2	19.15	2.95	1.79	22.15	3.10	1.09	19.86	6.46	31
GISP3	14.96	2.71	1.65	25.94	3.26	1.47	19.96	6.47	31
GISP4	19.01	2.95	1.66	16.61	2.81	0.93	20.06	6.45	31
HOLLY1	4.43	1.49	0.93	48.86	3.89	1.54	26.25	7.80	31
HOLLY2	4.80	1.57	1.18	80.67	4.39	1.52	26.21	7.79	31
HOLLY3	6.58	1.88	1.63	103.84	4.64	1.59	26.20	7.57	31
HOLLY4	6.68	1.90	1.37	91.16	4.51	1.64	26.84	7.47	31
HOLLY5	6.13	1.81	1.15	94.70	4.55	1.59	26.34	7.89	31
HOLLY6	8.05	2.09	1.44	120.14	4.79	1.66	26.39	7.76	31
LCNB1	19.93	2.99	1.71	40.06	3.69	1.33	13.10	4.84	30
LCSB1	9.75	2.28	1.88	58.97	4.08	1.52	16.34	4.44	30
LTFL1	3.19	1.16	0.77	93.65	4.54	1.79	27.12	7.05	31
MART1	4.17	1.43	0.97	94.90	4.55	2.01	26.94	7.16	30
PONT1	25.07	3.22	1.49	30.24	3.41	1.29	2.66	1.73	31
RUTH1	6.21	1.83	1.33	108.14	4.68	1.55	24.18	8.99	31

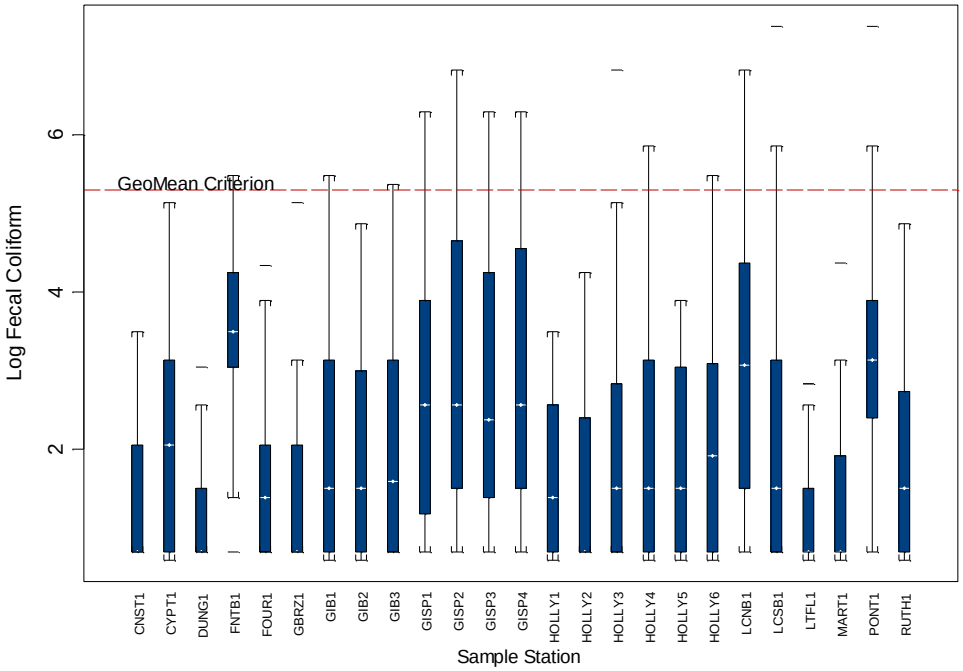


Figure 4. The distribution of $\log_e$ transformed fecal coliform densities (MPN/100ml) by sample station relative to the geometric mean criterion for samples collected during the 2011 designated monitoring season. The box represents the inner quartile range (25^{th} to 75^{th} percentiles), and upper and lower whiskers extending from the box represent the smallest and largest observations within one step (1.5 times inner quartile range). The median (◊) is marked by a line through the box, and horizontal bars (—) represent extreme values.

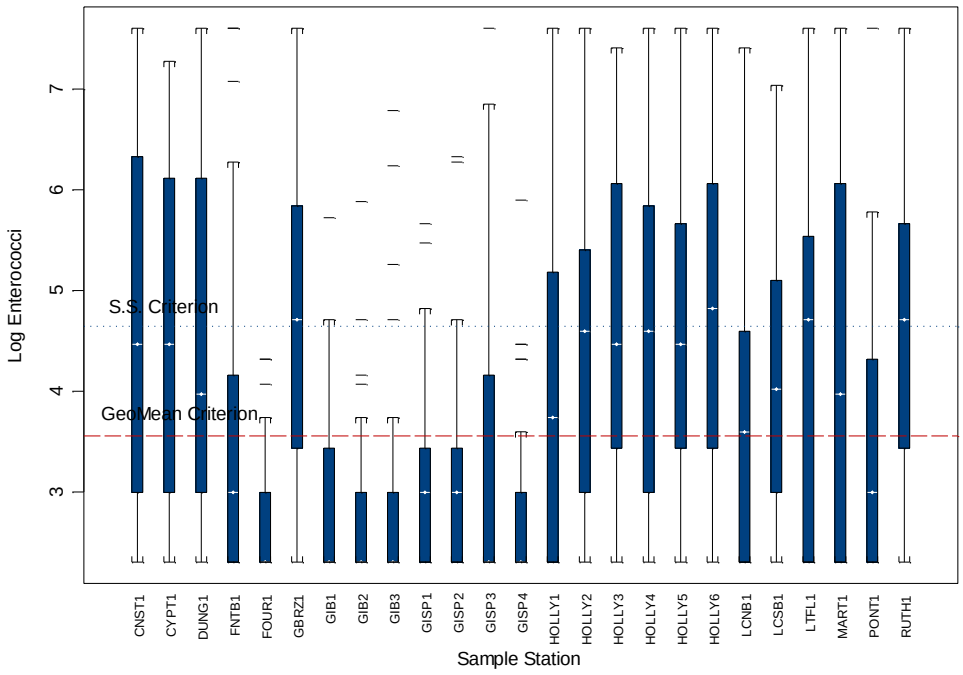


Figure 5. The distribution of $\log_e$ transformed enterococci densities (MPN/100ml) by sample station relative to geometric mean and single sample maximum criteria for samples collected during the 2011 designated monitoring season.

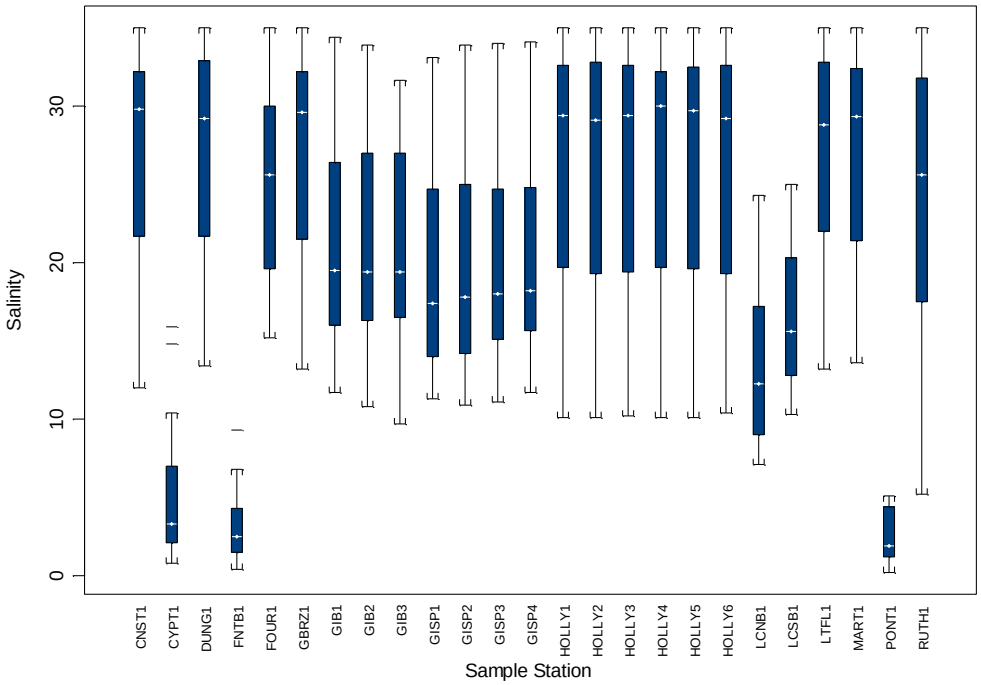


Figure 6. The distribution of salinity (ppt) by sample station for samples collected during the 2011 designated monitoring season.

Time-Series of 2011 Designated Monitoring Period Samples

In addition to calculating summary statistics for each sample station over the 2011 designated monitoring period, results are presented as a time-series (Appendix B, Figures B.1 through B.24; data for each sample event is provided in Appendix C). Because sample results were used during the designated monitoring season to make weekly determinations of whether or not water quality at each sample station met the Program's water quality criteria for Tier 1 and 2 beaches, sample results and the running 30-day geometric mean are shown in the figures. In each week, the last enterococci sample of the week and the running 30-day geometric mean for enterococci and fecal coliform must both be less than or equal to their respective criterion for the sample station to be classified as in compliance. If any criterion was exceeded, the sample station was classified as not in compliance and a swimming advisory was issued. The advisory remained in effect until the most recent sample results and the running geometric means were all less than or equal to their respective criterion.

Weekly Decision Rule Outcomes

During the 2011 swimming season (1 May – 31 October), 24 sample stations were monitored at ten Tier 1 or 2 continuous beach segments with a total of 62 advisories issued. Advisories were issued at 22 of the 24 sample stations during 2011 based on observed water quality exceedances (see Tables 8 and 9). There were no advisories issued at Fourchon Beach (FOUR1) or Grand

Isle State Park's west most station (GISP4). Compliance at stations with advisories varied between 85% of monitored days in compliance at GIB1 and GIB2, to a low of 7% for GBRZ1. Across all monitored sample stations, 46% (2,037 of 4,392) of the 2011 swimming season's available station-days were in compliance and not under an advisory. No beach closures were issued in 2011.

Similar to most prior years, all advisories issued in 2011 resulted from exceedances of enterococci criteria (Table 10). The geometric mean criterion was exceeded in 342 of 354 observed noncompliance weeks (97%), with 167 (47%) of those noncompliance weeks resulting from enterococci geometric mean exceedances only, and 175 (49%) resulting from both enterococci geometric mean and single sample maximum exceedances. Only 12 (3%) of the 354 observed exceedances were the result of exceeding the single sample criterion alone. As discussed in previous Louisiana BEACH Grant reports, Louisiana's percentage of monitored station-weeks that were in compliance is not directly comparable with other states that do not use equivalent decision criteria. If Louisiana's decision rule were based only on the enterococci single sample maximum criterion, the State would have failed to detect 47% of the observed noncompliance weeks during 2011.

When exceedances of water quality criteria were detected, an advisory was issued. To notify the public that a swimming advisory was in effect, the BEACH Program's monitoring/advisory sign at the sample site was opened, a press release was issued, and notice of the advisory was placed on the OPH BEACH website (http://new.dhh.louisiana.gov/index.cfm/page/288).

Table 8. Advisory history by sample station and week for beach segments designated and monitored as either Tier 1 or Tier 2 beaches during the 2011 swimming season.

	Advisory Condition as of Friday for Each Week - 2011 Swimming Season																									
	May				**June**				**July**					**August**				**September**					**October**				
Station ID	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	2	9	16	23	30	7	14	21	28	EOS
CNST1	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		A		A			A	A		
CYPT1	A	A					A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
DUNG1	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A										
FNTB1	A	A	A	A			A	A	A	A	A	A	A		A	A	A	A	A	A				A			
FOUR1																											
GBRZ1	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		A	A	A	A	A	A	A	A	A
GIB1								A			A		A		A												
GIB2													A		A	A	A										
GIB3			A					A			A	A	A	A	A												
GISP1											A	A	A	A	A	A	A	A	A								
GISP2									A		A	A	A		A			A	A		A	A					
GISP3			A						A		A	A	A	A	A		A	A	A	A	A						
GISP4																											
HOLLY1	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A											
HOLLY2	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						A	A	A	A	A	A
HOLLY3	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		A							A	A
HOLLY4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		A							A	A
HOLLY5	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				A					
HOLLY6	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				A	A				
LCNB1	A															A	A	A	A	A	A	A	A	A	A	A	A
LCSB1	A									A		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
LTFL1	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				A		A	A	A	A	A
MART1	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A											
RUTH1	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			A			A	A	A

Notes: **"A"** indicates an advisory was put in place or remained in effect at the beach based on observed water quality data. FOUR 2-4, and HACK1 are not shown as they were not sampled in 2011 due to access constraints.

Table 9. Summary of 2011 advisories and closures.

State ID	Days Under Closure	% of Station-Days Under Closure	Remaining Available Station-Days	Days Under Advisory	% of Remaining Station-Days Under Advisory	% of Remaining Station-Days In Compliance
CNST1	0	0%	183	147	80%	20%
CYPT1	0	0%	183	150	82%	18%
DUNG1	0	0%	183	119	65%	35%
FNTB1	0	0%	183	126	69%	31%
FOUR1	0	0%	183	0	0%	100%
GBRZ1	0	0%	183	171	93%	7%
GIB1	0	0%	183	28	15%	85%
GIB2	0	0%	183	28	15%	85%
GIB3	0	0%	183	49	27%	73%
GISP1	0	0%	183	63	34%	66%
GISP2	0	0%	183	63	34%	66%
GISP3	0	0%	183	84	46%	54%
GISP4	0	0%	183	0	0%	100%
HOLLY1	0	0%	183	112	61%	39%
HOLLY2	0	0%	183	143	78%	22%
HOLLY3	0	0%	183	129	70%	30%
HOLLY4	0	0%	183	129	70%	30%
HOLLY5	0	0%	183	133	73%	27%
HOLLY6	0	0%	183	140	77%	23%
LCNB1	0	0%	183	80	44%	56%
LCSB1	0	0%	183	115	63%	37%
LTFL1	0	0%	183	150	82%	18%
MART1	0	0%	183	112	61%	39%
RUTH1	0	0%	183	84	46%	54%
Totals	0	0%	4,392	2,355	54%	46%

Notes: FOUR2-FOUR4 and HACK1 are not included in this table because they were not monitored in 2011 due to access constraints.

Table 10. Summary of weekly decision rule exceedances by cause for 2011.

Cause of Exceedance	Number of Observed Exceedances	% of Observed Exceedances
Only fecal coliform geometric mean criterion exceeded	0	0%
Only Enterococci geometric mean criterion exceeded	167	47%
Only Enterococci single sample max criterion exceeded	12	3%
Both Enterococci geometric mean and single sample max criteria exceeded	175	49%
Both Enterococci and fecal coliform geometric mean criteria exceeded	0	0%
All criteria exceeded	0	0%
Total	**354**	**100%**

Relationship Between Indicator Organisms and Environmental Conditions

Louisiana's BEACH Program uses both fecal coliform and enterococci as indicator organisms in its decision rule to determine beach water quality compliance. Enterococci are used because recent studies have shown that they perform better than fecal coliform in marine waters as they are more closely correlated with gastroenteritis rates (see USEPA 2002 for a review of indicator organisms). Fecal coliform was included in Louisiana's BEACH Program's decision rule primarily because it is specified in the state's Sanitary Code (LAC 51:XXIV §909.B) and Water Quality Standards (LAC 33:IX §1113.5.a) as the indicator organism for determining water quality in natural waters. Secondarily, fecal coliform was included because all historic bacteriological water quality data collected by the State, other than under the BEACH Program, consists of fecal coliform densities.

In order to associate historic patterns of water quality with current patterns based on enterococci densities, the relationship between fecal coliform and enterococci densities was examined in previous BEACH Reports. A rigorous statistical analysis of the relationship between fecal coliform and enterococci densities was presented in the *Louisiana BEACH Grant Report, 2007 Swimming Season*. Through that analysis we learned that although the relationship between fecal coliform and enterococci was positive (higher levels of enterococci are associated with higher levels of fecal coliform), it varied among continuous beach segments by year and required adjustment for the effects of water temperature. Accordingly, it was concluded that the relationship is quite complex, making the prediction of enterococci density from historic fecal coliform data complex and imprecise.

Of greater interest than the relationship between indicator organisms is how the density of indicator organisms is influenced by environmental factors. Knowing the influence of environmental factor on indicator organism densities can help identify possible sources of elevated bacteria and is required to develop predictive models, which USEPA has encouraged. Predictive models are used to predict when water quality standards are likely to be exceeded based on readily observable conditions, and provide a basis for issuing precautionary advisories. Issuance of precautionary advisories would supplement the current sample result-based advisory process, overcoming the limitations from the poor relationship in day-to-day indicator organism densities in natural waters and the protracted time between sample collection and obtaining results. Because all advisories issued from the Program's inception in 2004 through 2011 involved exceedance of enterococci criteria, investigation of the influence of environmental factors on indicator organism densities focused on enterococci. More specifically $\log_e$ transformed enterococci density was examined because greater than 90% of exceedances under the Program involved exceedance of the enterococci geometric mean criterion and because enterococci densities are log-normally distributed.

With each water sample collected by the BEACH Program, environmental variables were also collected, including surface water temperature (°F), salinity (ppt), tide conditions, weather conditions, and wind direction and speed. Total precipitation (in.) 0–24 hrs (precip0), 24–48 hrs (preciplag1), 48–72 hrs (preciplag2), and 72–96 hrs (preciplag3) prior to sample collection were estimated using rain basin precipitation values taken from Louisiana's Molluscan Shellfish database. Rain basin daily precipitation was estimated by averaging observed precipitation at

rain gauges within the rain basin, and beaches were assigned to the rain basin in which they occurred. The number of days between sample collection and the most recent prior day with a precipitation record > 0 (DaysSinceLastRain) was estimated, and daily precipitation estimates were summed into measures of total precipitation within 0–48 hrs (precip48) and 0–72 hrs (precip72) prior to sample collection.

Using the observed environmental variables, estimated precipitation values and the associated $\log_e$ transformed enterococci densities collected by the Program from 2004 through 2009, CEHS performed a thorough statistical analysis to determine how indicator organism density was influenced by environmental factors at Louisiana's coastal beaches (the 2009 analysis). Note that for that analysis, sample stations at Fourchon and Fourchon-West were considered to be from a single contiguous beach segment, Fourchon Beach (FOUR), because of the similarities among values observed at the segments. To facilitate the analysis, the number of categories for tide, weather, and wind direction and speed were reduced, which also eliminated categories with few observations. The nine Tide categories (high, high falling, low, low falling, normal, high rising, low rising, extremely low, and extremely high) were used to create a new variable, TideHNL, consisting of three categories (high, normal and low). Similarly, the eight Weather categories (clear, scattered clouds, partly cloudy, cloudy, mist, fog, light rain, and rain) were used to create the new two category variable, Sunny (under clear conditions Sunny = 1 else 0). The 18 WindDirection categories (the 4 cardinal and 12 ordinal directions plus calm and variable) were transformed to WindDirNSEW consisting of five categories (N, S, E, W and calm). The six Wind speed categories (0 mph, plus five categories of 5 mph increments starting at 0-5 mph) were transformed to a continuous variable, "numeric WindSpeed".

The results of the 2009 analysis confirmed the findings of previous reported analyses that there were no statistically meaningful differences among sample stations within continuous beach segments (StateID explains almost none of the variation in enterococci density), and that enterococci densities have changed from year to year (Year) at all beach segments except Fourchon, which has remained stable. The complete results of the 2009 analysis were reported in the *Louisiana BEACH Grant Report, 2009 Swimming Season*, which concluded that:

> "given the available data, it is unlikely that models that can reliably predict enterococci densities can be developed for Louisiana's beaches. Different environmental factors are most correlated with enterococci density for different beach segments and area groups, and no single environmental factor is useful in predicting indicator organism density. It also appears that the relationship between environmental factors and enterococci density is complex and will take more investigation to understand, requiring targeted studies that are not funded under current Beach Grants. Better measurement of the environmental variables that are currently being collected and/or collection of additional environmental measures may be required to adequately predict water quality from observable environmental conditions. Louisiana beaches are somewhat different from those of most coastal states in that they represent a wide range of salinity conditions and most are relatively remote from urban runoff, reducing the direct association between environmental conditions and enterococci densities."

Through 2011, a total of 5,164 independent[1] samples were collected (Table 11); 1,555 samples beyond those available in 2009. Given the additional data available, the analysis was repeated. Using the data collected through 2011, the analysis yielded the same conclusions as were drawn following the 2009 analysis. That is, year-to-year differences in enterococci density at all beach segments other than FOUR was a significant source of variation (Figure 7), and that for most beach segments, the relationship between the environmental variables and enterococci density changed from year to year (Figures 8-14). Additionally, the observed year-to-year variation in enterococci density was not explained by corresponding differences in the environmental variables.

Table 11. Number of independent swimming season samples by continuous beach segment and year.

	Year								
Beach Segment (# Sample Stations)	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**Segment Totals**
CNSTBC (5)	0	128	80	181	140	150	150	154	983
CYPT (1)	33	23	33	30	28	30	30	31	238
FNTB (1)	39	22	15	30	28	28	30	31	223
FOUR[1] (4)	0	93	0	123	68	87	76	31	478
GIB (3)	0	66	91	92	84	84	88	93	598
GISP (4)	135	91	128	122	38	84	110	124	832
HACK-RUTH (2)	0	53	32	67	47	29	30	31	289
HOLLY (6)	0	153	96	211	166	180	180	186	1,172
LCNB (1)	0	0	0	0	0	30	30	30	90
LCSB (1)	0	0	0	0	0	30	30	30	90
PONT (1)	28	0	0	28	27	28	29	31	171
Year Totals	235	629	475	884	626	760	783	772	5,164

[1] Sample tallies were summed across the Fourchon and Fourchon-West contiguous beach segment sample stations for this summary.

Because of large year to year differences in enterococci densities and associated annual variance within all beach segments except for Fourchon Beach, and annual differences in the relationship between enterococci density the environmental variables, developing useful statistical model that go beyond finding a general pattern of environmental conditions that are associated with higher/lower enterococci densities is not possible for Louisiana's more remote beaches. The only possible exceptions are the urban Lake Charles area beaches (LCNB and LCSB); the only urban beach segments currently monitored under Louisiana's BEACH Program. For the remote beaches or those removed from major population centers, the relationship between environmental factors and enterococci density is complex and will take more investigation to understand, requiring targeted studies that are not funded under current Beach Grants.

[1] For analysis purposes, single samples collected on a date at a sample location were considered independent; multiple samples collected on a date at a sample location were averaged together and considered independent.

Development of useful predictive models may be possible for the Lake Charles area beaches, but additional data are required to better determine the extent of annual variation in enterococci density to determine if that variation can be adequately modeled as a random effect. Based on data collected trough 2011, enterococci density appears to be highly influenced by annual differences not accounted for in the observed environmental variables, but generally increases with increasing precipitation (precip72), calm or high winds, and increasing salinity at a given water temperature, or increasing water temperature with high salinities but decreases with increasing water temperature at low salinities (significant temperature-salinity interaction). Assuming that a suitable predictive model can be developed in the future, sources for local salinity and water temperature data would need to be identified for the models to have administrative value.

Figure 7 also shows that there is a generally increasing trend in enterococci density at the Cameron Parish Beaches (CNSTBC, HACK-RUTH, and HOLLY), CYPT, and FNTB. Enterococci density at FOUR, GIB and GISP during 2011 was comparable to prior years and was relatively free of a trend over the observed period.

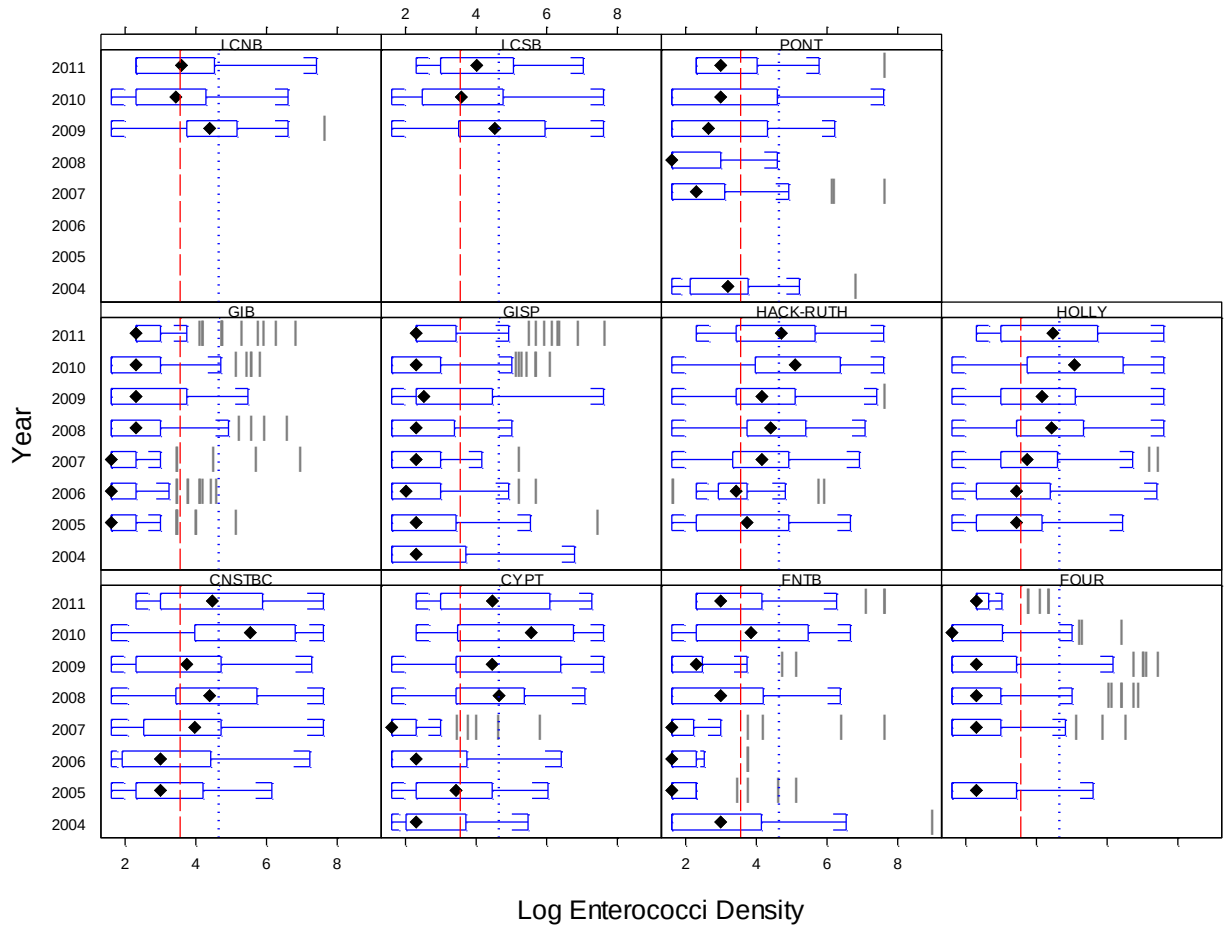


Figure 7. Distribution of $\log_e$ enterococci densities by year within continuous beach segments relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).

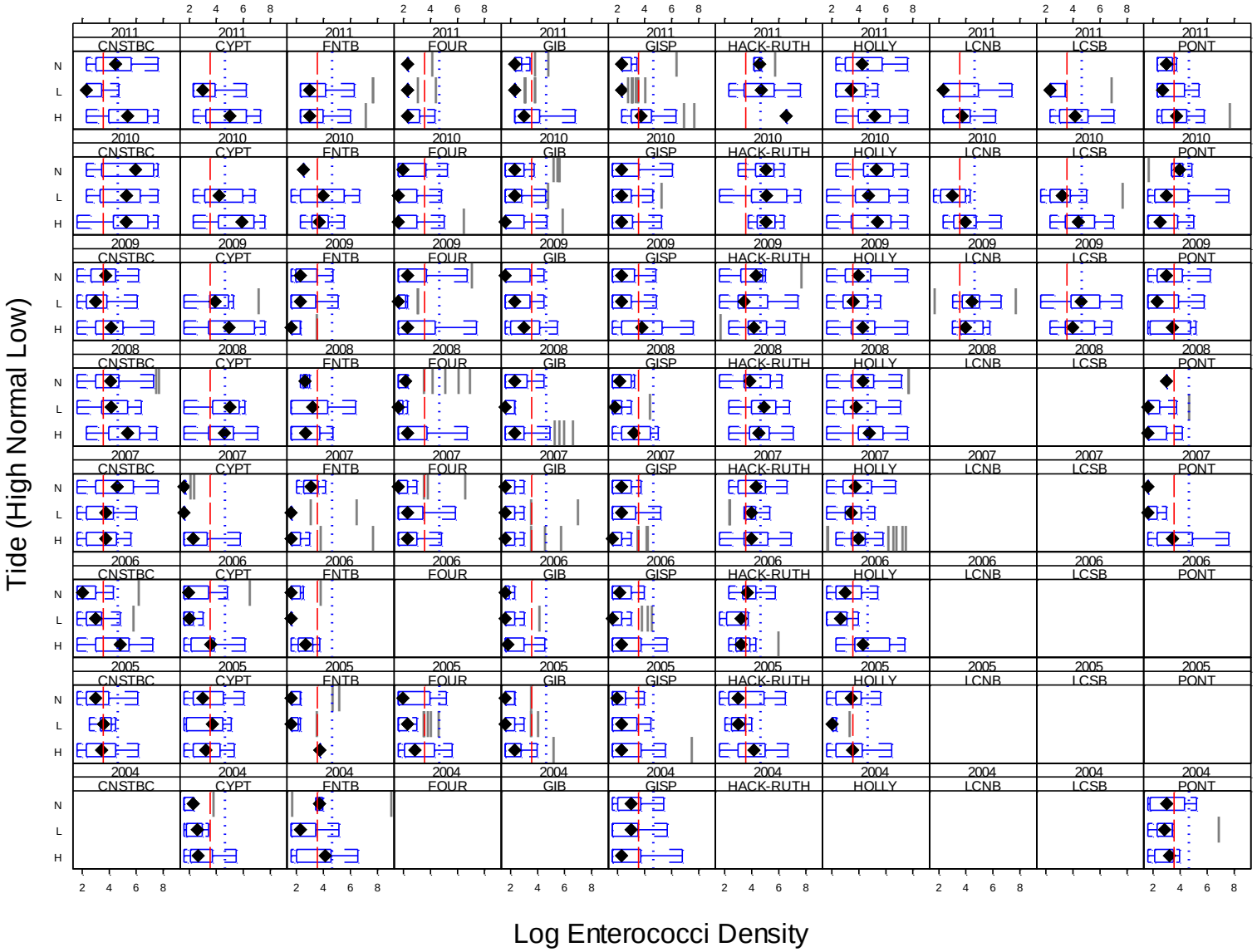


Figure 8. Distribution of $\log_e$ enterococci densities by tide condition (high, normal or low) within continuous beach segment and year relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).

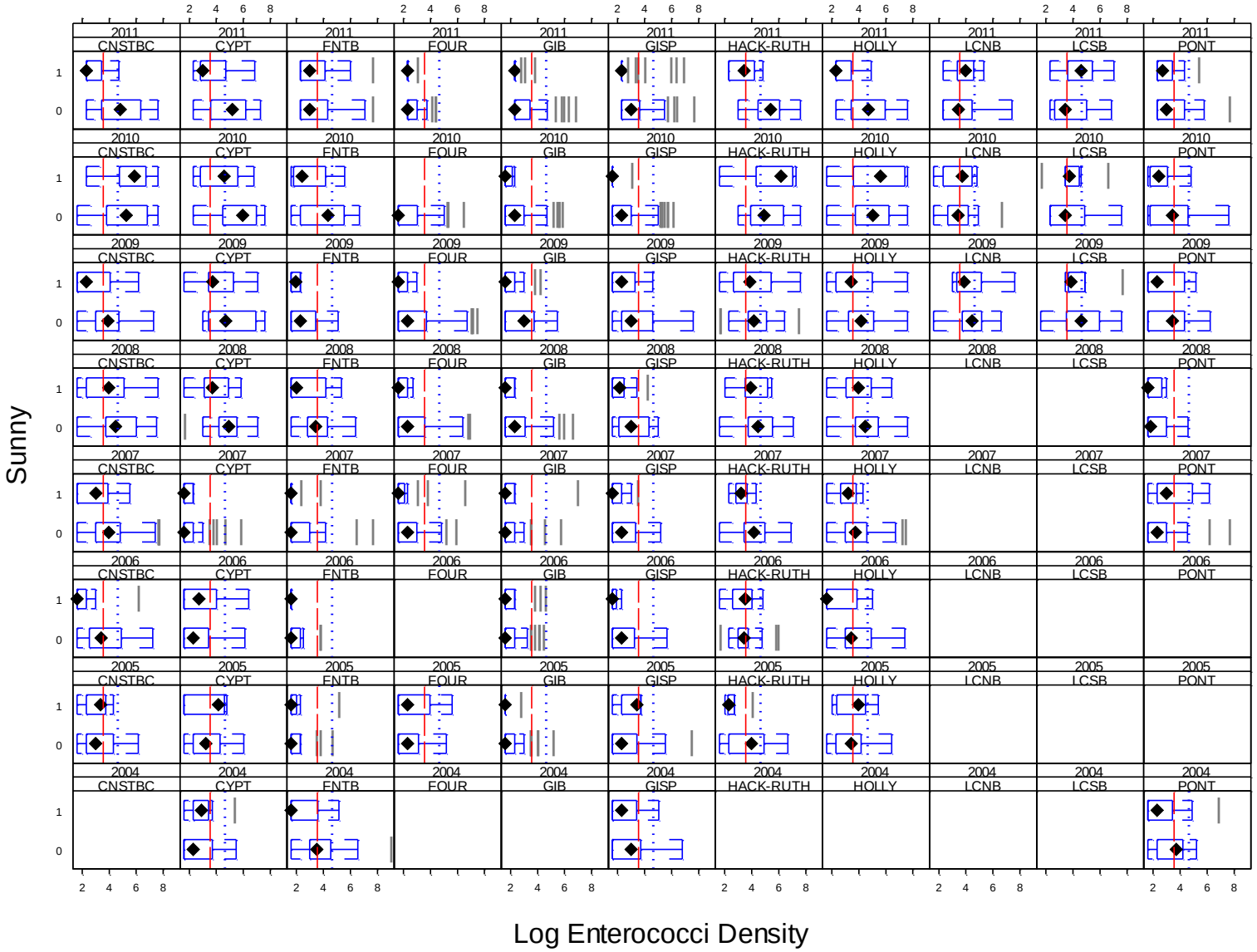


Figure 9. Distribution of $\log_e$ enterococci densities by cloud cover conditions (sunny = 1 or cloudy = 0) within continuous beach segment and year relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).

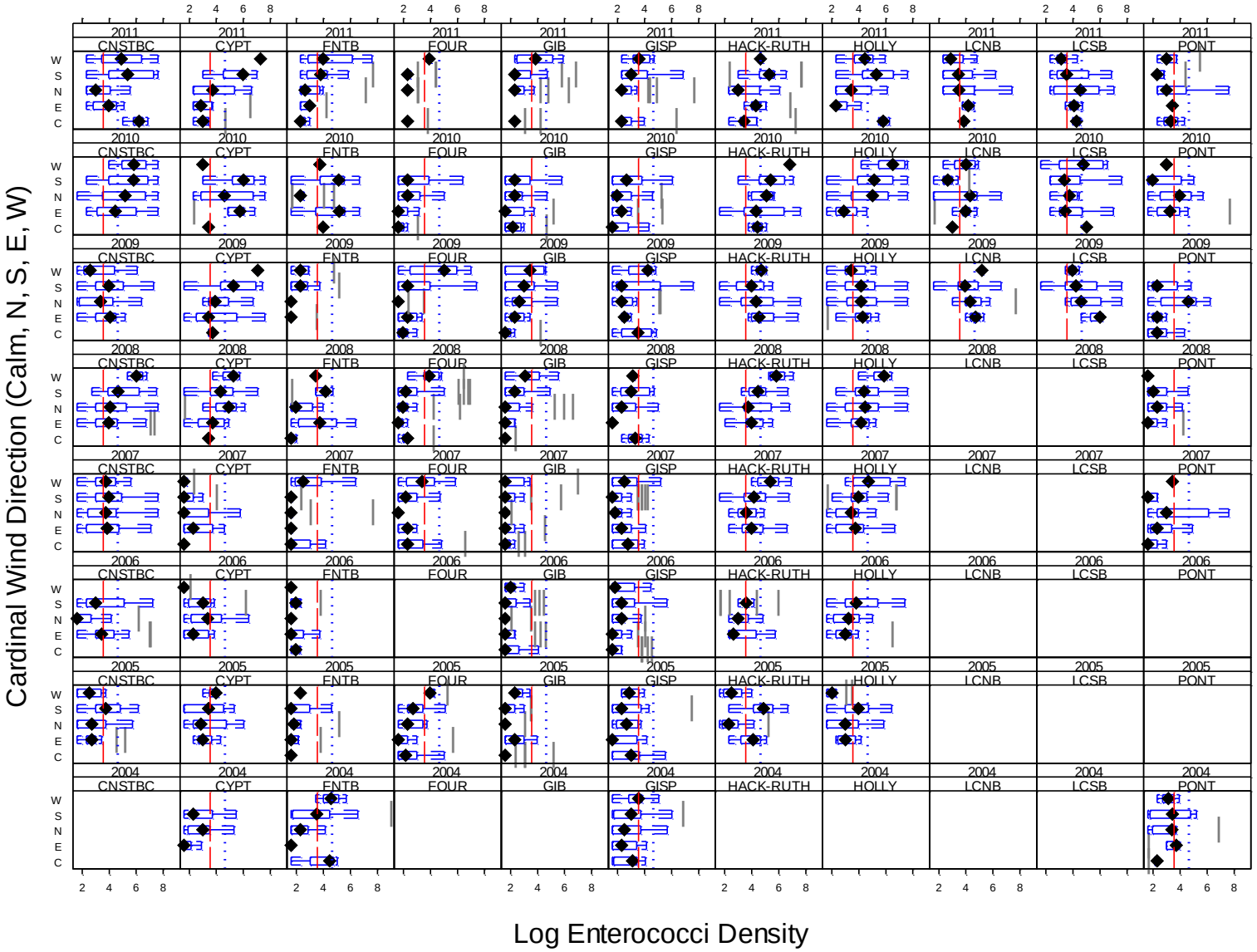


Figure 10. Distribution of $\log_e$ enterococci densities by cardinal wind direction within continuous beach segment and year relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).

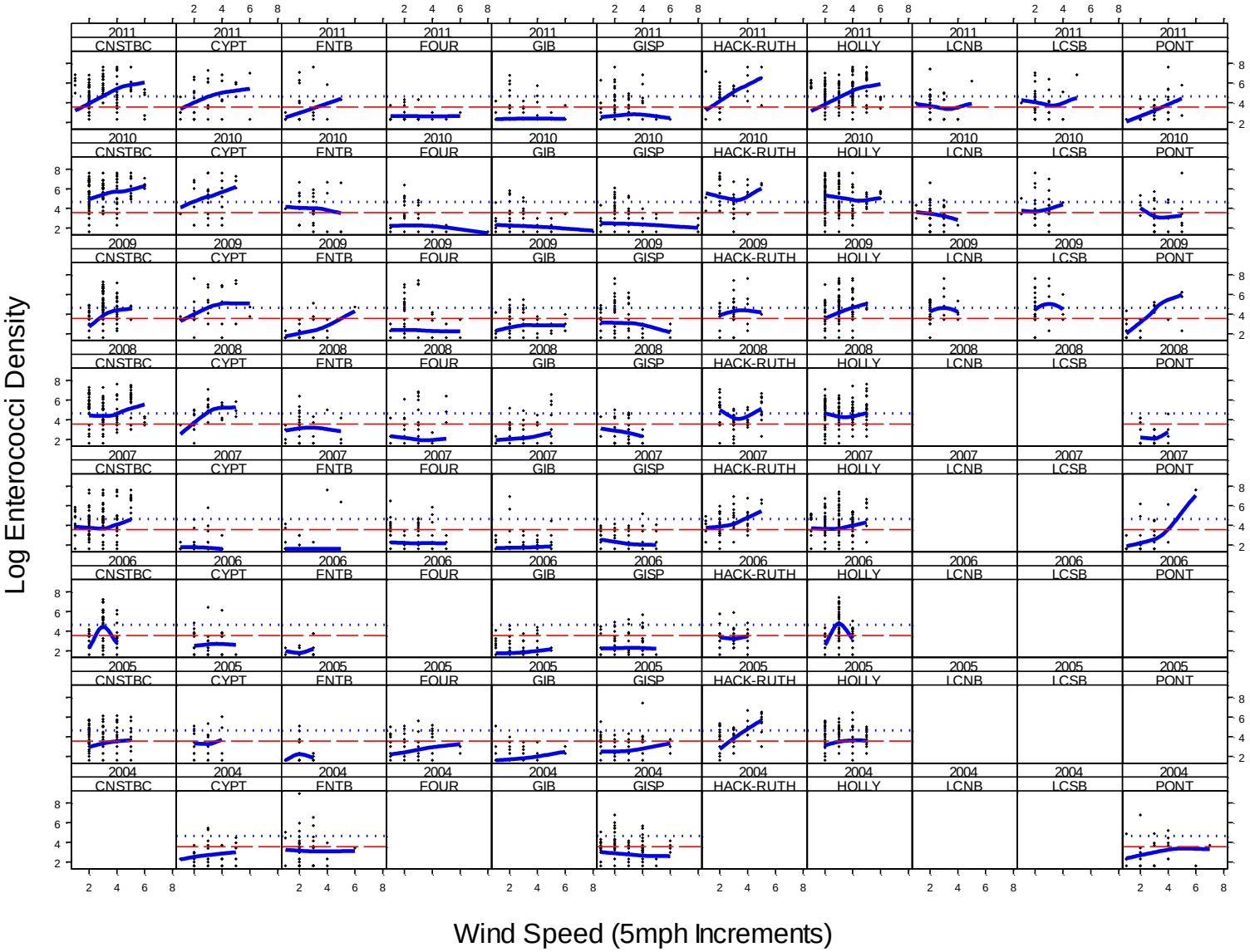


Figure 11. Distribution of $\log_e$ enterococci densities by wind speed within continuous beach segment and year relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).

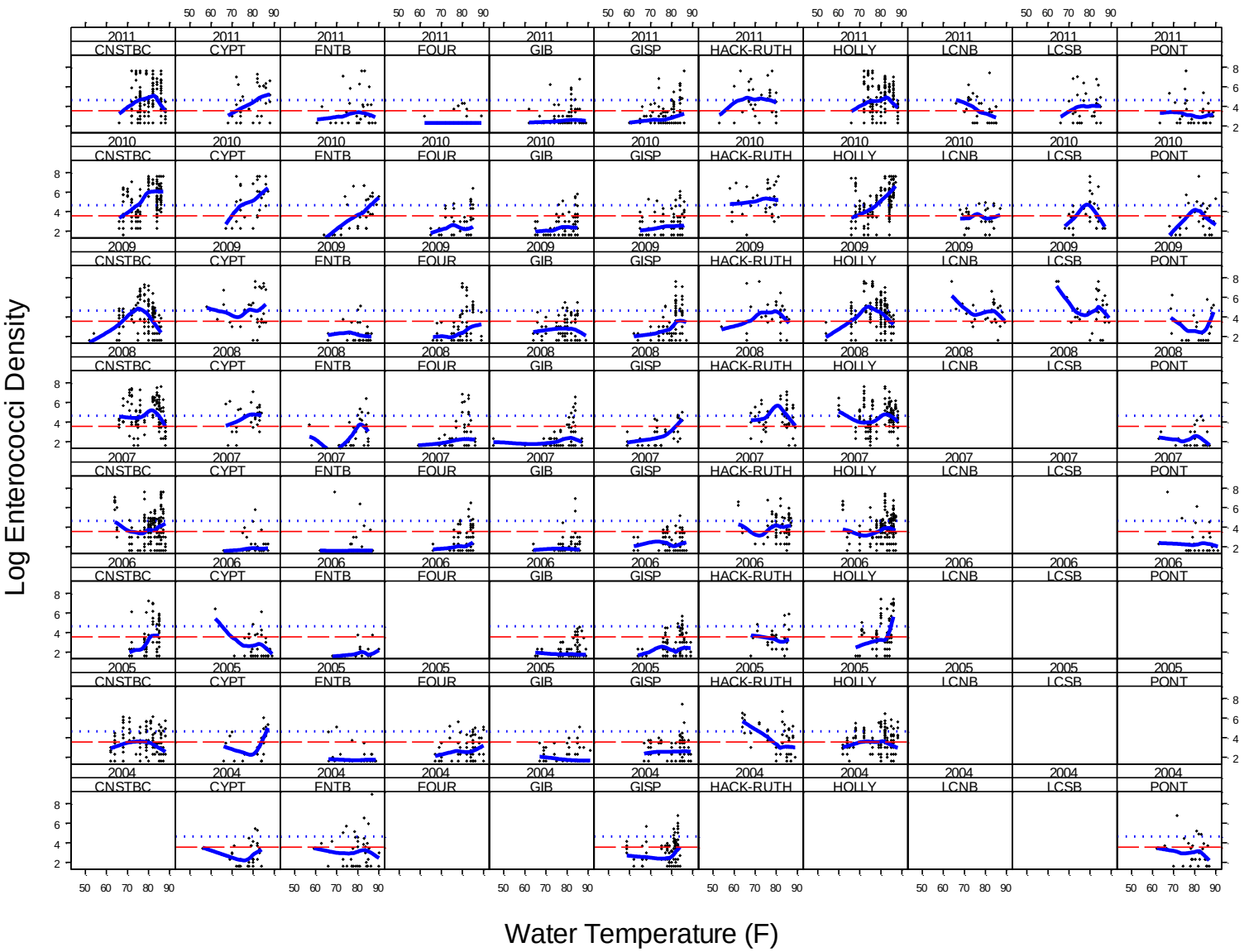


Figure 12. Distribution of $\log_e$ enterococci densities by surface water temperature within continuous beach segment and year relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).

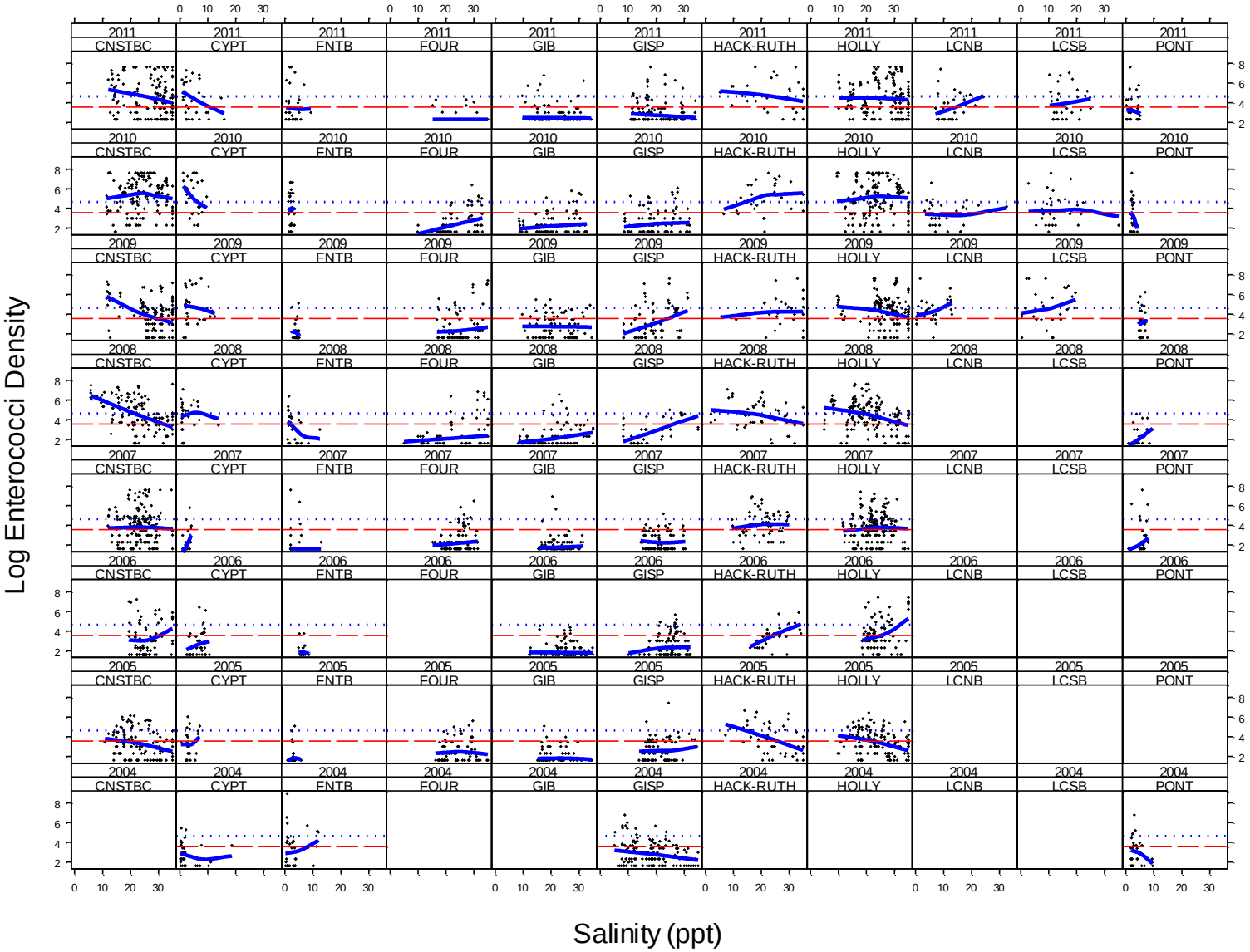


Figure 13. Distribution of $\log_e$ enterococci densities by salinity within continuous beach segment and year relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).

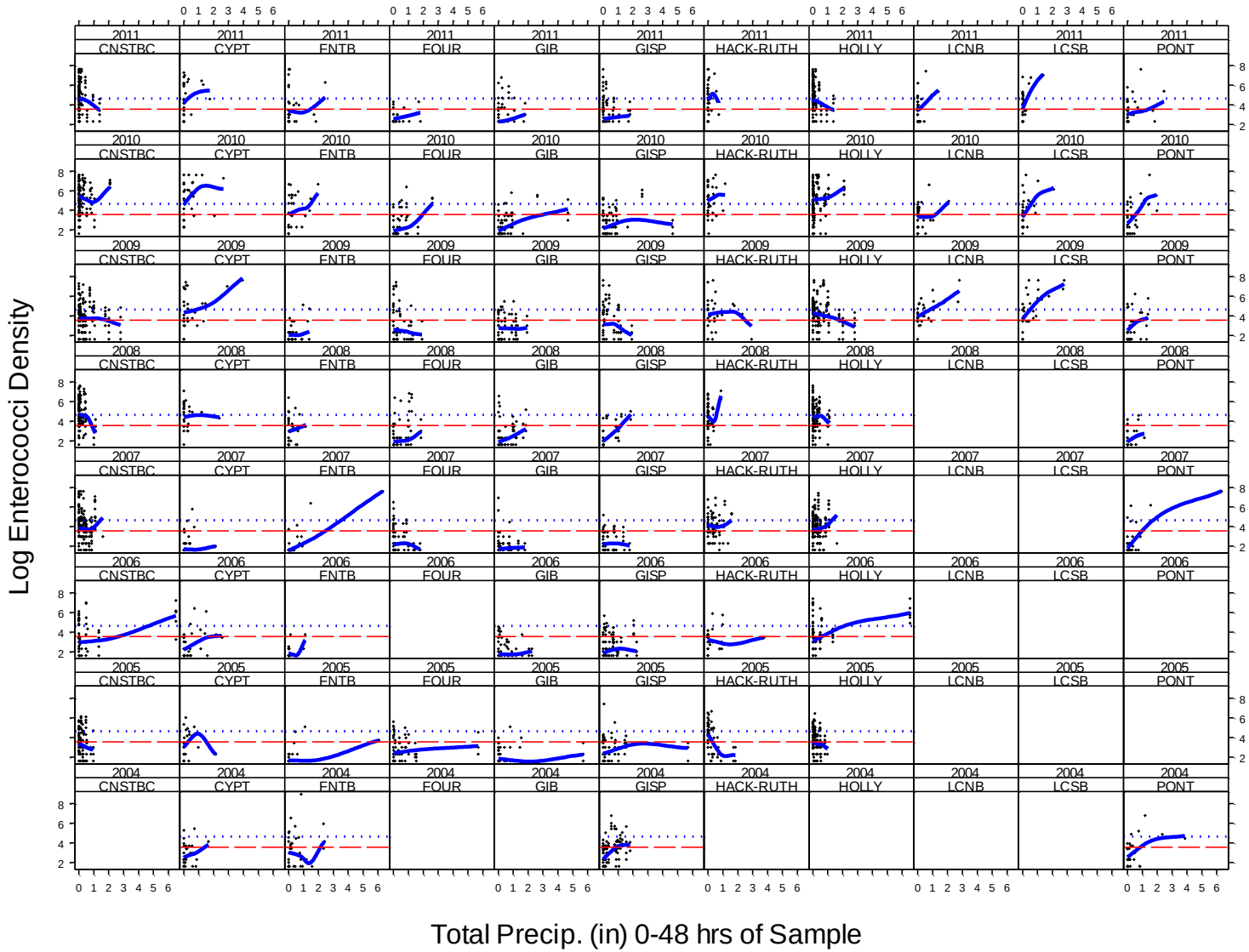


Figure 14. Distribution of $\log_e$ enterococci densities by precipitation 0-48 hrs prior to sampling within continuous beach segment and year relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).

CHAPTER 4. Evaluation of Program Performance Relative to Data Quality Objectives.

Louisiana's BEACH Program Quality Assurance Project Plan (LDHH 2009) states that at the end of each year, the Program Manager shall audit the Program to determine if the Program's data quality objectives are being met. As described in the QAPP (see Table A7.1 of the QAPP), the Program's data quality objectives for those parameters measured in accordance with the QAPP are expressed in terms of accuracy, precision, and completeness goals. Those data quality objectives are repeated below in Table 12, together with their 2011 results.

Table 12. Data quality objectives and 2011 results.

Parameter	Concen-tration Units	QAPP Precision Goals (RPD)	2011 Precision Mean RPD (± 1 SE, n)	QAPP Completeness Goals	2011 Completeness
Enterococci	MPN/ 100ml	Sample 60%; lab 45%	Sample 43.7% (±7.5, 42); lab 41.7% (±7.5, 35)	98%	100%
Fecal Coliform	MPN/ 100ml	Sample 60%; lab 45%	Sample 50.0% (±6.5, 42); lab 51.0% (±8.2, 35)	98%	100%
Salinity	ppt	Sample 10%, lab 5%	Sample 1.1% (±0.4, 42); lab 1.2% (±0.2, 35)	98%	100%
Surface Water Temperature	°F	$\pm$ 2°	$\pm$ 2° by SOP	98%	99.9%
Tide Conditions	NA	NA	NA	98%	100%
Weather	NA	NA	NA	98%	100%
Wind Direction	NA	NA	NA	98%	100%
Wind Speed	NA	NA	NA	98%	100%
Precipitation	Inches/ previous 24 hours	NA	NA	98%	100%
River Stage	Feet on flood gauge	NA	NA	98%	100%

To evaluate compliance with the established data quality objectives (DQOs) for sample and laboratory precision on estimated indicator organism densities and salinity, the results from QC samples, which are always collected in conjunction with a routine sample, calibration sample or resample, were compared to the corresponding sample result. Prior to the start of the monitoring period, approximately 10% of scheduled samples (routine and calibration samples) were designated as quality control samples. QC samples were selected at random at the beginning of the sampling period in approximately equal proportions (~ 5% each) of field duplicate and field split samples. Unscheduled QC samples were also collected during some routine sample events, which are also included in the QC evaluation. Sampling and laboratory precision were then

estimated from each quality control sample by calculating the relative percent difference (*Sample RPD*) as follows:

$$Sample\ RPD = \frac{|C_1 - C_2|}{(C_1 + C_2)/2}\ x\ 100$$

where C_1 is the routine sample (or calibration or resample) result and C_2 is the quality control sample result. To estimate precision across samples, the mean and standard deviation of Sample RPDs were calculated. Note that the precision goals are expressed as means, and compliance with precision goals is assessed by determining if the observed precision is statistically different from the goal.

During 2011, a total of 77 quality control samples were scheduled to be collected. The 77 scheduled quality control samples were to consist of 42 field duplicates and 35 field split samples. Forty-one (41; 98%) field duplicates and 32 (91%) field-split samples were collected as scheduled, resulting in 95% of QC samples collected as scheduled. Additionally, four unscheduled QC samples were collected (1 field duplicate and 3 field split sample) in conjunction with routine sample events to make up for missed QC samples resulting in 100% of the QC sample goal achieved.

To evaluate compliance with QAPP precision goals, means and standard errors of sample RPDs were calculated for the 2011 QC samples and are presented in Table 12. Figures 15-17 show Sample RPD results relative to precision goals; if the lower error bar (lower 95th percentile) shown in the graph is below the goal, then the goal has been achieved. All precision goals were achieved for 2011. However, lab (field split) and sampling (field duplicate) QC results for fecal coliform and enterococci remained comparable to 2010, contrary to expectations. Field splits were designed to estimate the variability of the analysis process, or "lab" precision, plus any minor imprecision resulting from sample handling and transport. Field duplicates were designed to incorporate lab variability plus sampling variability to estimate the variability of collecting another sample at approximately the same place and time. Accordingly, lab RPDs should be smaller than sample RPDs. Assuming that field duplicate and split samples are properly recorded and handled in the field, recent QC results indicate that sampling variability is minimal.

Completeness is the percentage of measurements made that are judged to be valid according to specific criteria and entered into the data management system. Percent completeness *(%*C) for measurement parameters was estimated as follows:

$$\%C = \frac{V}{T}\ x\,100$$

where *V* is the number of measurements judged valid and T is the total number of measurements. During 2011, of the 850 samples collected 847 were successfully processed and the results considered valid and recorded in the Program's database. Of the 847 valid records, all had complete laboratory- and field-collected data except for one, which was missing water temperature. Lab results were lost for two samples and a lab accident resulted in the loss of an additional sample. Accordingly, all completeness goals for 2011 were achieved.

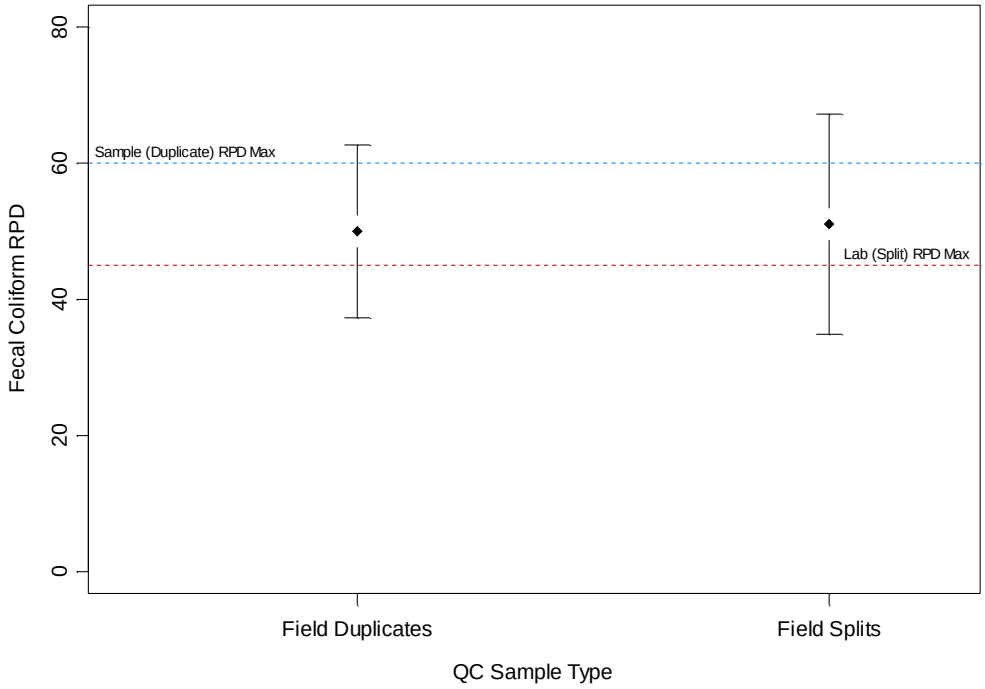


Figure 15. Comparison of 2011 monitoring season mean fecal coliform relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.

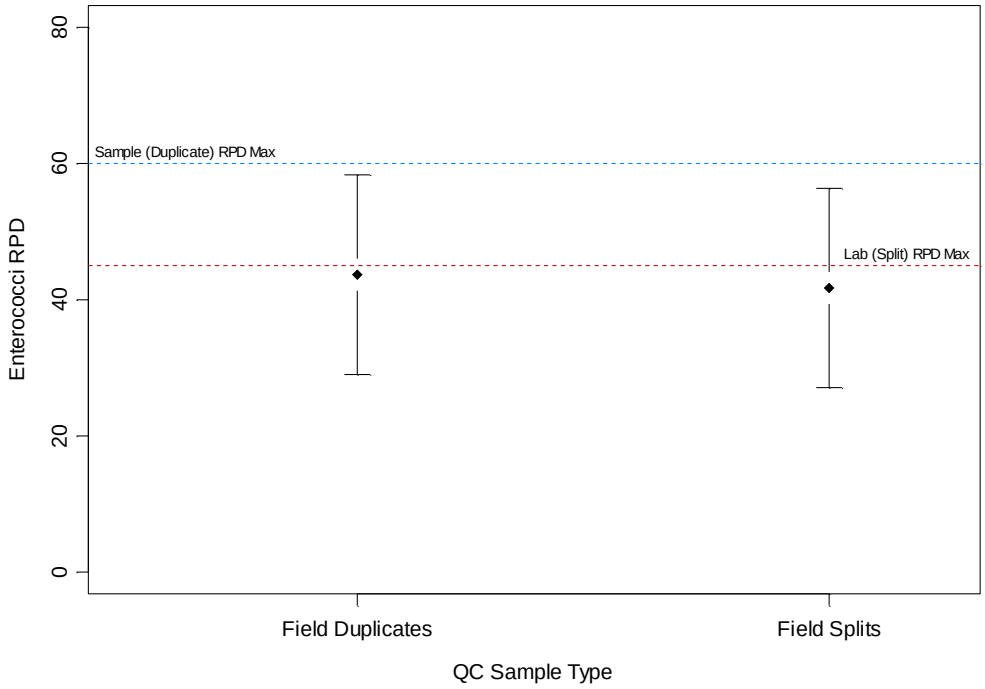


Figure 16. Comparison of 2011 monitoring season mean enterococci relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.

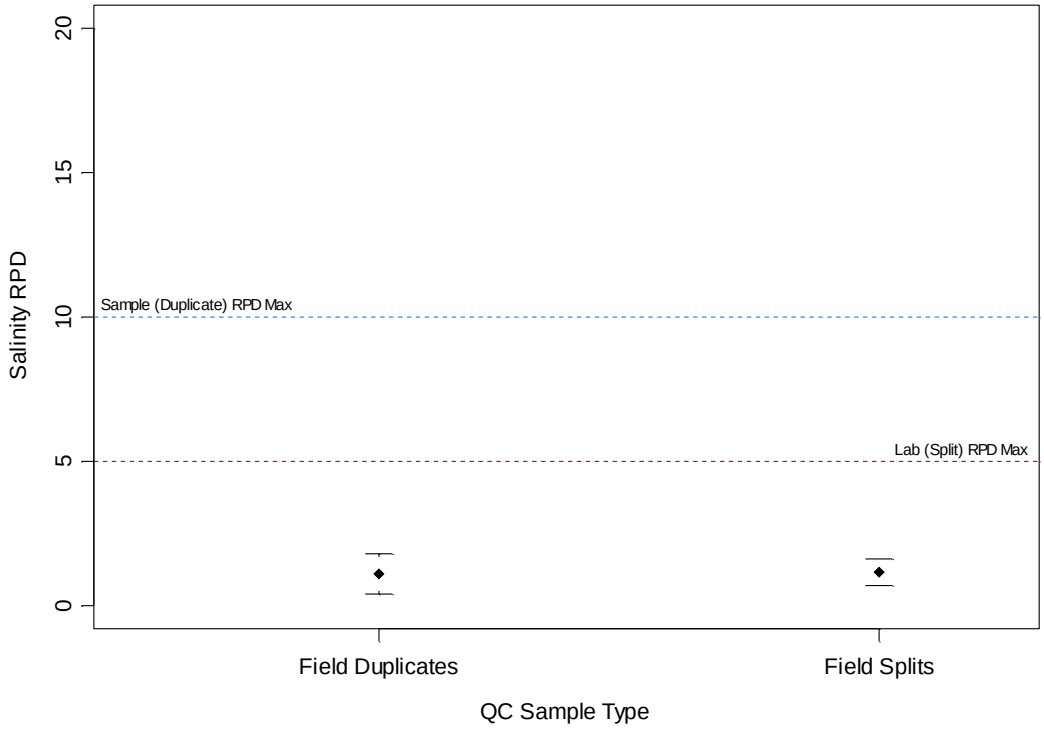


Figure 17. Comparison of 2011 monitoring season mean salinity relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.

Based on a thorough review of the data recorded for the 2011 season, there was only one variance from the QAPP; the minimum enterococci density that was recorded in the database was 10 rather than 5. The QAPP defines the minimum recorded densities of indicator organisms as follows:

> "Fecal coliform and enterococci results that are reported as less than detection limits (shown as "<2" for fecal coliform and "<10" for enterococci) will be recorded in the database as 2 for fecal coliform and 5 for enterococci." (LDHH 2011, p. 32)

Based on 2009 and 2010 enterococci results, approximately 150 samples would be expected to have a result of <10 in 2011 and about 100 would be expected to have a result of 10. Therefore, approximately 150 of the 2011 samples were expected to have an enterococci result of 5 in the database, and approximately 100 samples were expected to have an enterococci value of 10. However, 266 samples in the 2011 data set had an enterococci value of 10 and no samples had a value of 5. Because of personnel changes within the Program, enterococci results of <10 reported by the lab were recorded as 10 rather than 5 in the database. Steps have been taken to ensure that lab results that are reported as less than detection limits will be properly recorded in the database in future years. Although a variance from the QAPP, the impact of recording the <10s as 10s on 2011 advisories was minimal, and in the rare case where it did result in an

advisory that would not have been issued had the result been properly entered as 5, the advisory erred on the side of protecting public health.

In addition to the audit and data review described above, the BEACH Program Manager/Quality Assurance Officer verified throughout the 2011 sampling period that:

- All elements of the QAPP were being correctly implemented as prescribed except for the enterococci less than detection limit recordation error noted above;
- The quality of the data generated by implementation of the QAPP was adequate; and
- Corrective actions, when needed, were implemented in a timely manner and their effectiveness was confirmed.

The only inconsistency with the QAPP during 2011 was recordation of enterococci results that were reported as less than detection limits but recorded as 10 rather than 5. The impact of that variance was minimal, and erred toward protection of public health. The BEACH Program Manager/Quality Assurance Officer will reinforce the need for adherence with the QAPP, including proper data recordation, prior to the start of the 2012 sampling period. All monitoring and notification data collected during 2011 have been uploaded to USEPA's BEACH (PRAWN) and STORET data systems via WQX submission of an XML formatted file.

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APPENDIX A

Sample Station Names and USEPA IDs

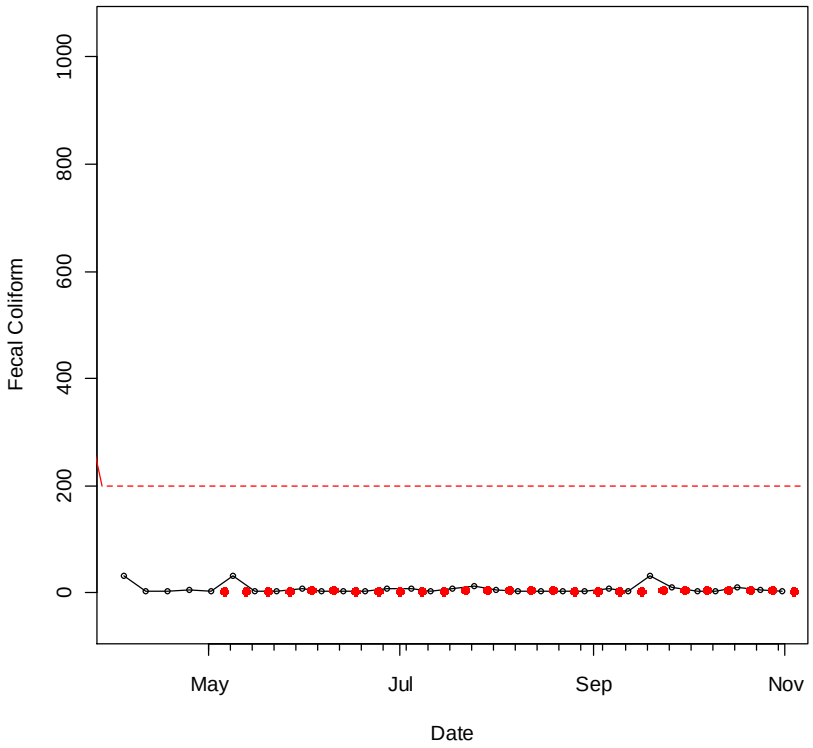
List of sample stations designated under the Louisiana BEACH Program by State ID, Beach Name, and USEPA IDs.

State ID	Beach Name	USEPA ID
CNST1	Constance Beach	LA134778
CYPT1	Cypremort Point State Park	LA971783
DUNG1	Long Beach	LA860482
ELMR1	Elmer's Island - 1	LA834833
ELMR2	Elmer's Island - 2	LA451844
FNTB1	Fontainebleau State Park	LA733869
FOUR1	Fourchon - 1	LA427986
FOUR2	Fourchon - 2	LA984228
FOUR3	Fourchon - 3	LA677480
FOUR4	Fourchon - 4	LA452669
GBRZ1	Gulf Breeze	LA725358
GIB1	Grand Isle Beach - 1	LA430483
GIB2	Grand Isle Beach - 2	LA325065
GIB3	Grand Isle Beach - 3	LA799656
GISP1	Grand Isle State Park - 1	LA240078
GISP2	Grand Isle State Park - 2	LA221569
GISP3	Grand Isle State Park - 3	LA204303
GISP4	Grand Isle State Park - 4	LA186192
HACK1	Hackberry Beach	LA720012
HOLLY1	Holly Beach - 1	LA489985
HOLLY2	Holly Beach - 2	LA829030
HOLLY3	Holly Beach - 3	LA109442
HOLLY4	Holly Beach - 4	LA697221
HOLLY5	Holly Beach - 5	LA164373
HOLLY6	Holly Beach - 6	LA467180
LCNB1	North Beach	LA202517
LCSB1	South Beach and Rabbit Island	LA981443
LTFL1	Little Florida	LA595220
MART1	Martin Beach	LA135245
PONT1	Pontchartrain Beach	LA960851
RUTH1	Rutherford Beach	LA284049

APPENDIX B

Time Series of Water Quality Results By Sample Station

A



B

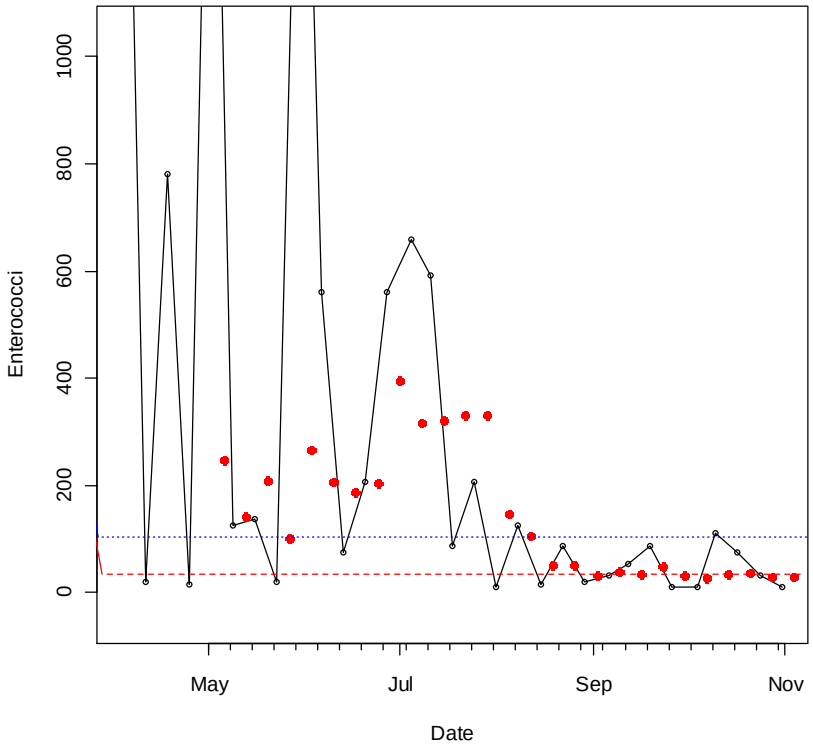
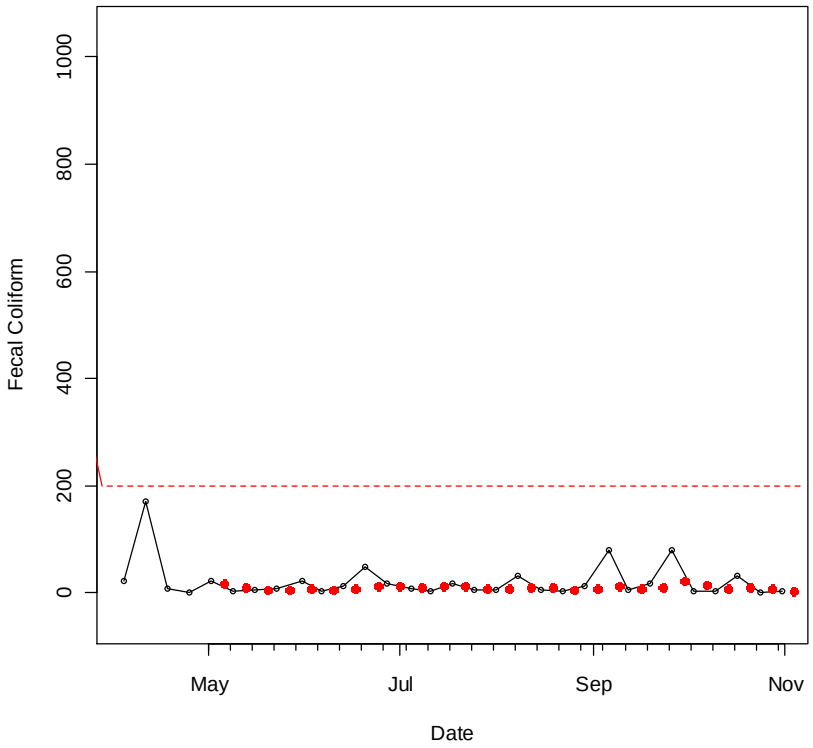


Figure B.1. Time series of fecal coliform (A) and enterococci (B) sample results collected during 2011 at CNST1. Sample results are shown as open dots (◦), running 30-day geometric means are shown as red dots (•), and geometric mean and single sample maximum criteria are shown as red and blue dashed horizontal lines, respectively.

A



B

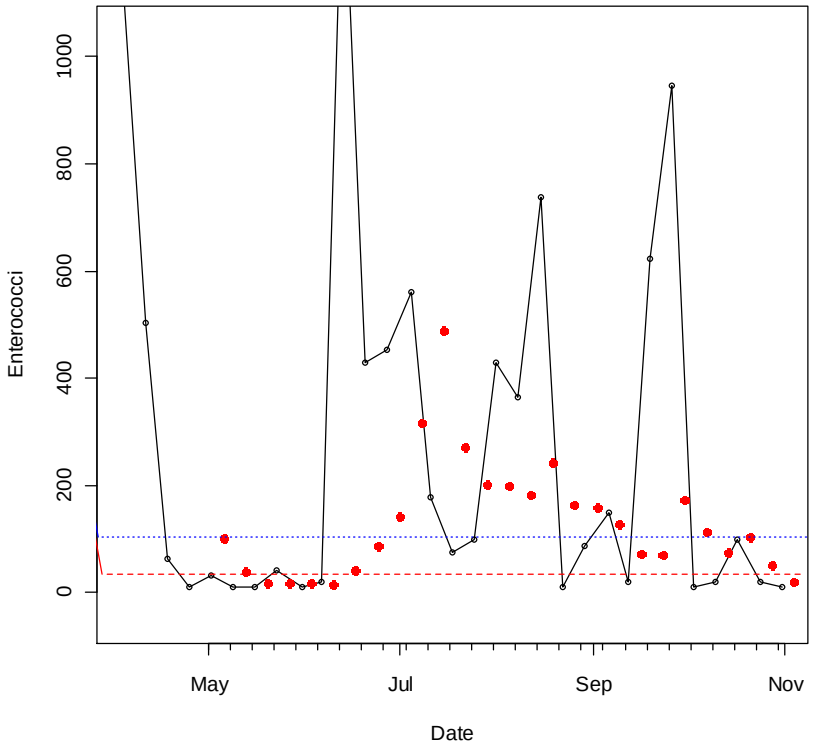
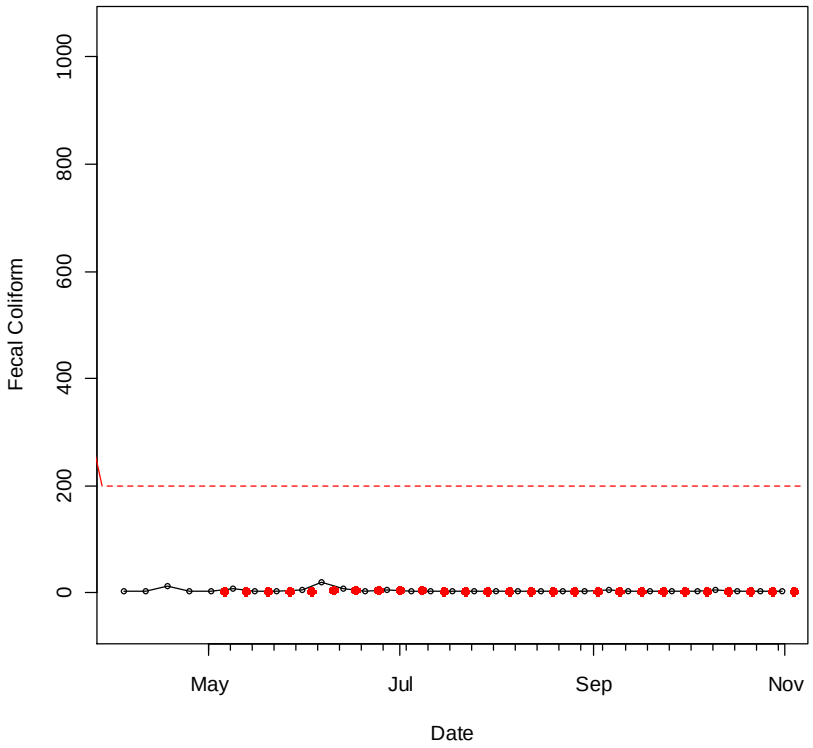


Figure B.2. Time series of sample results collected during 2011 at CYPT1.

A



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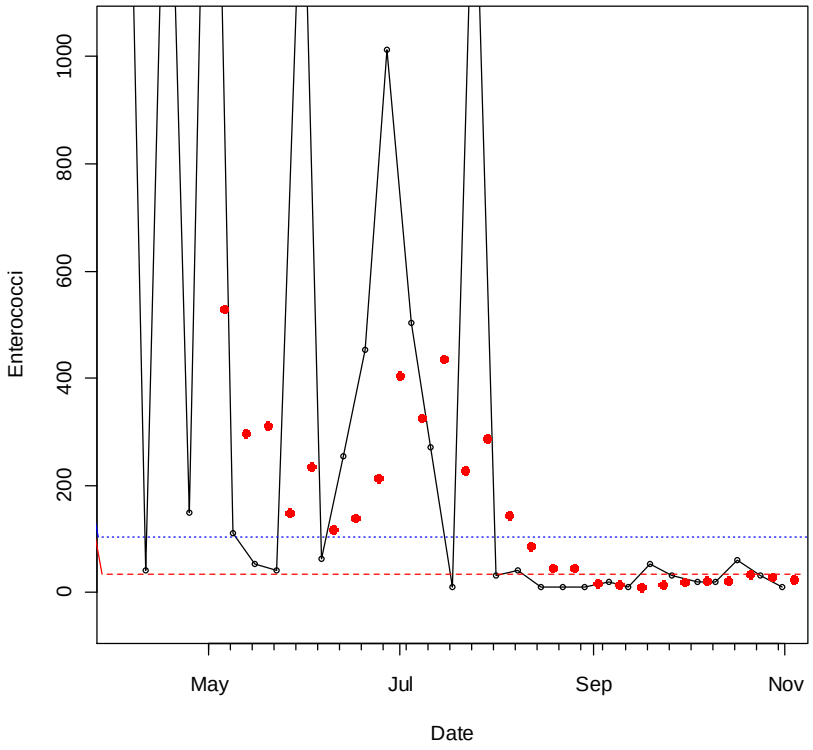
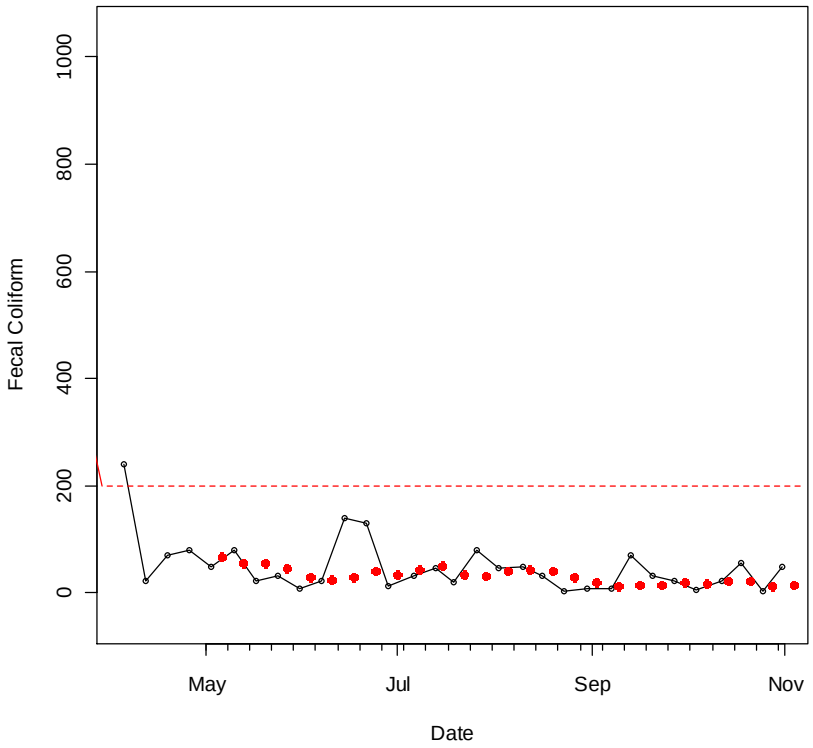


Figure B.3. Time series of sample results collected during 2011 at DUNG1.

A



B

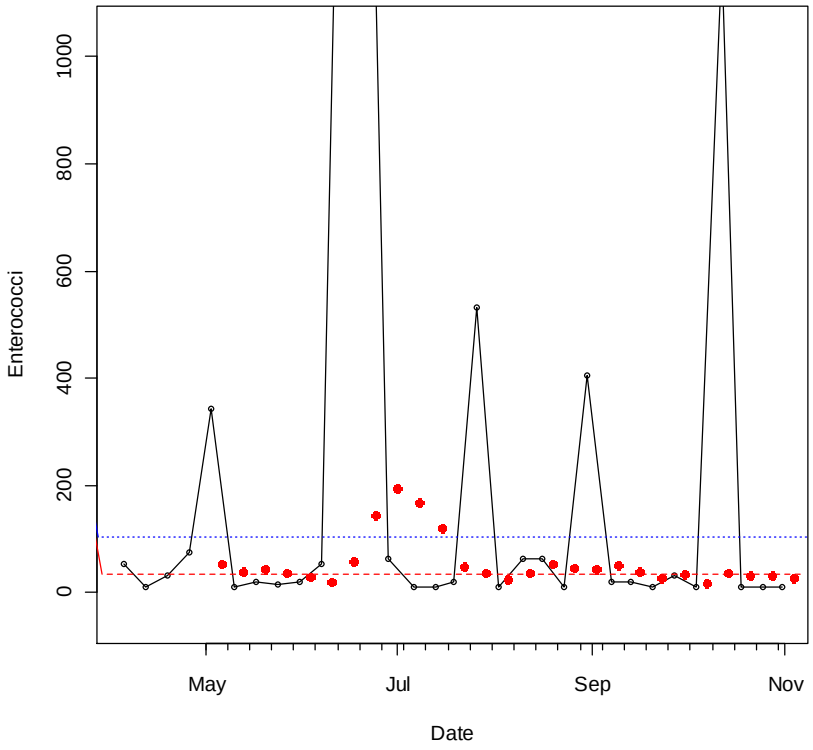
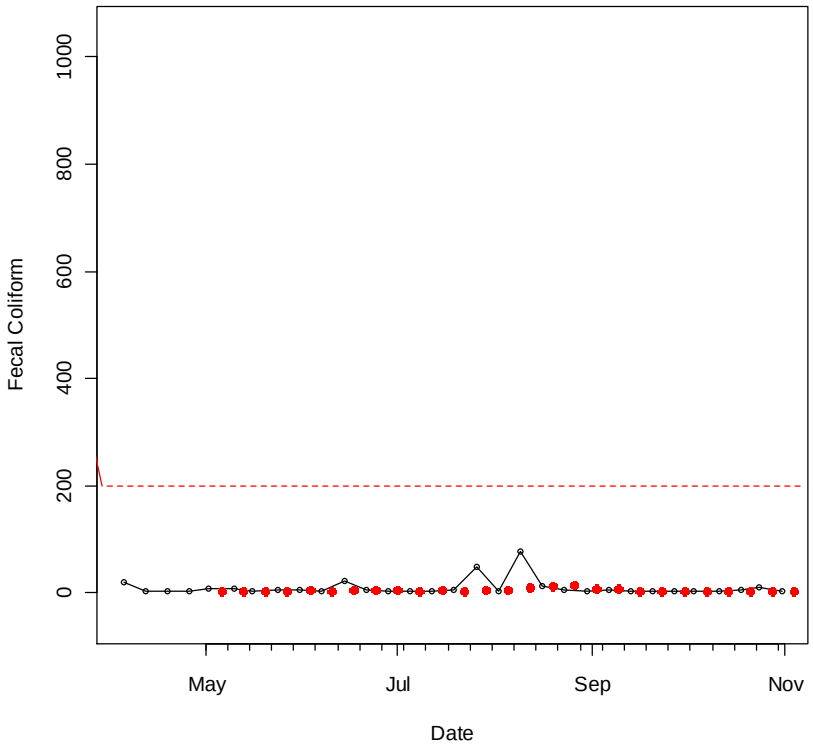


Figure B.4. Time series of sample results collected during 2011 at FNTB1.

A



B

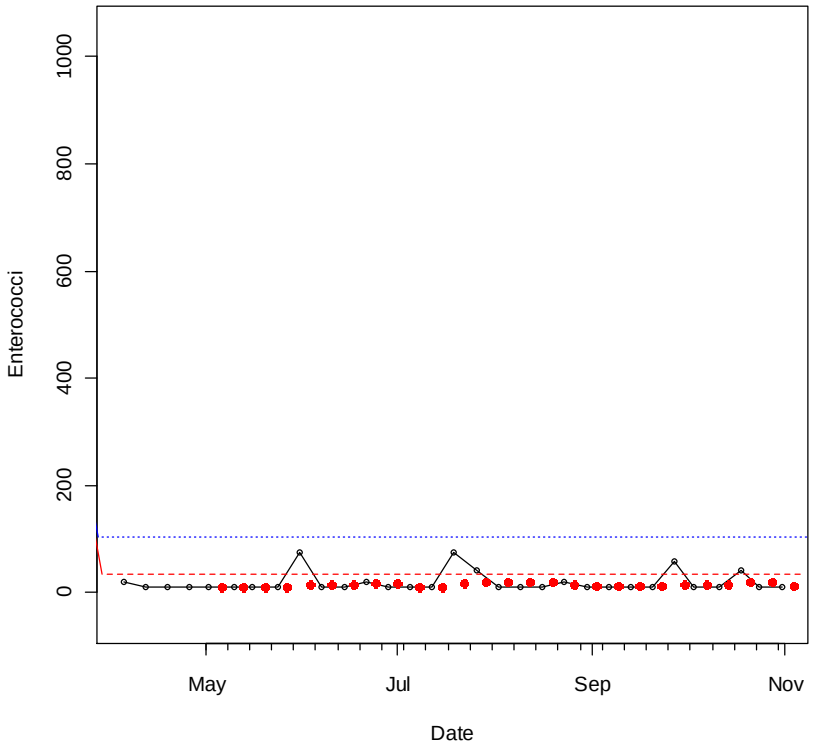
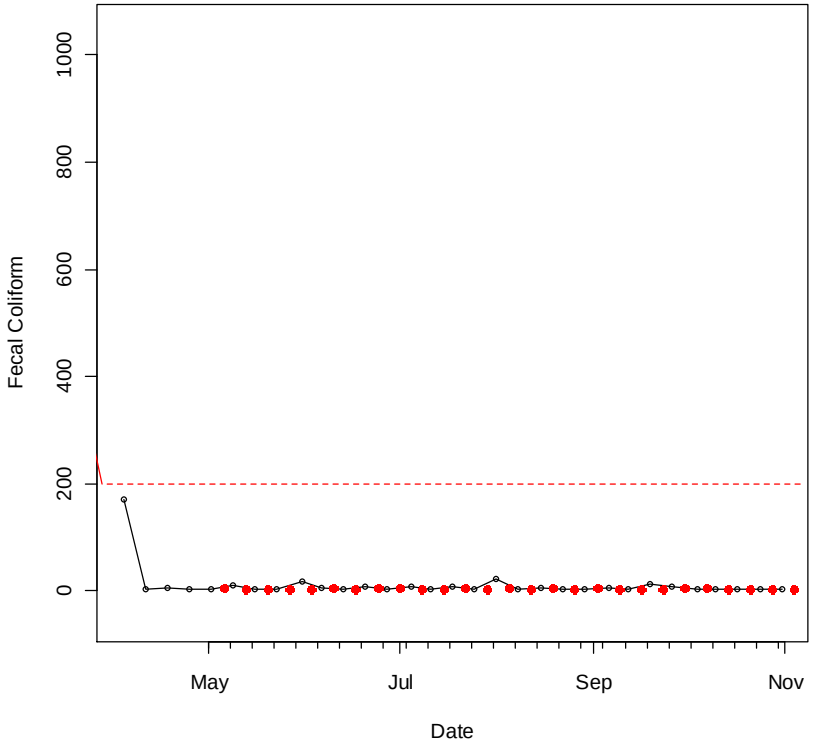


Figure B.5. Time series of sample results collected during 2011 at FOUR1.

A



B

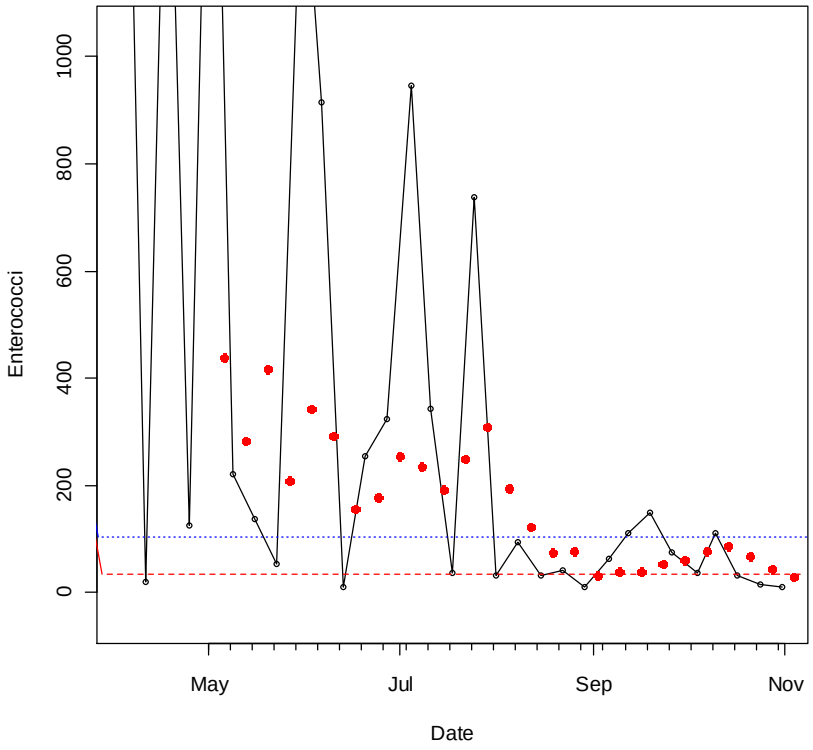
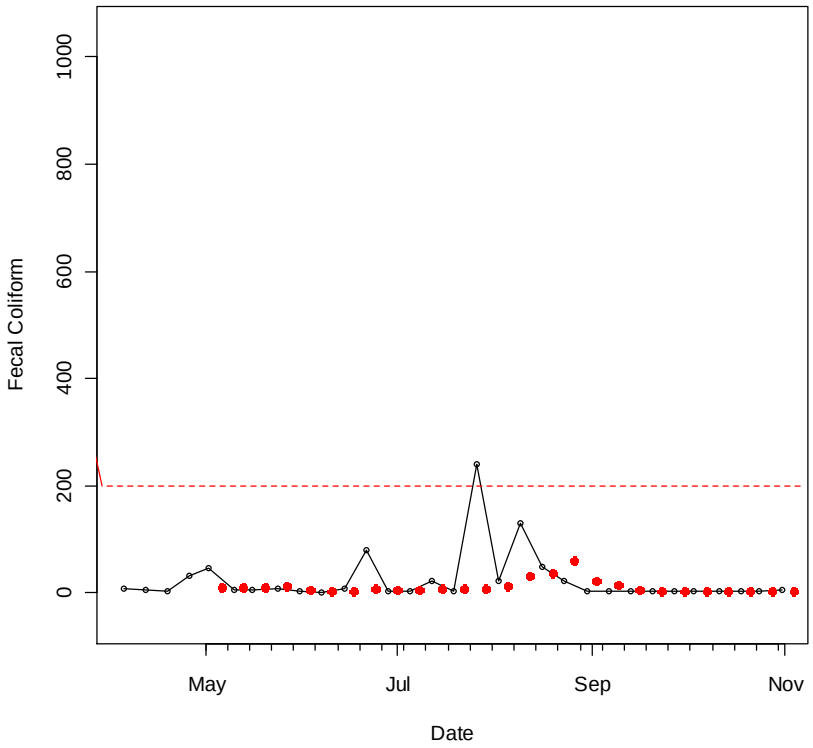


Figure B.6. Time series of sample results collected during 2011 at GBRZ1.

A



B

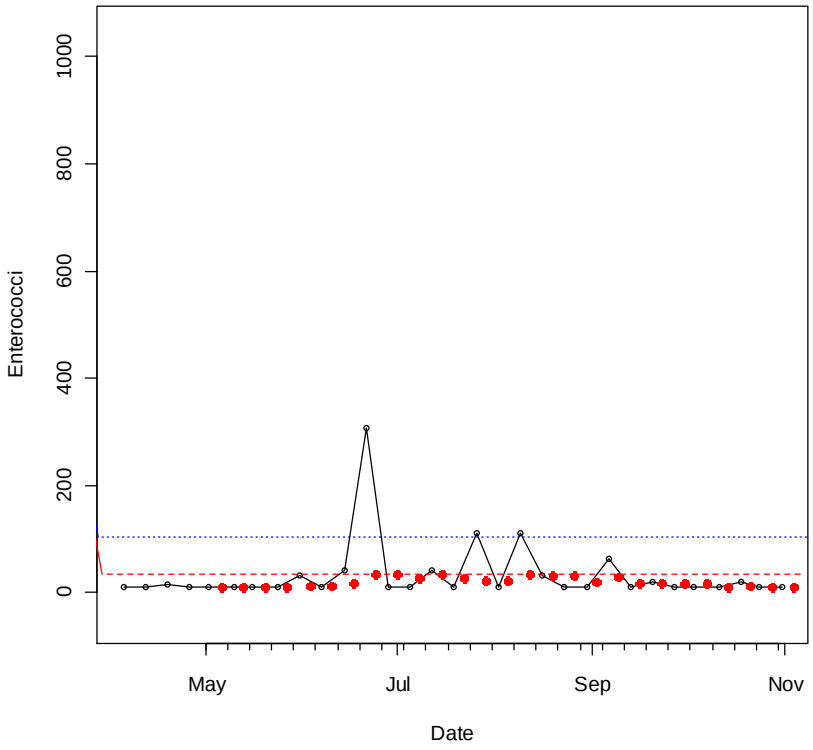
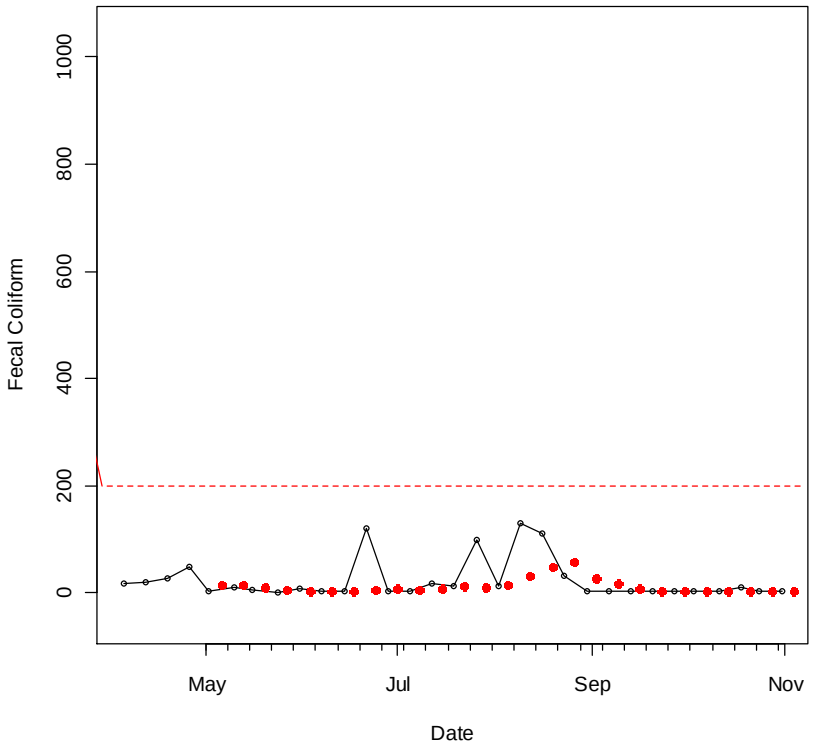


Figure B.7. Time series of sample results collected during 2011 at GIB1.

A



B

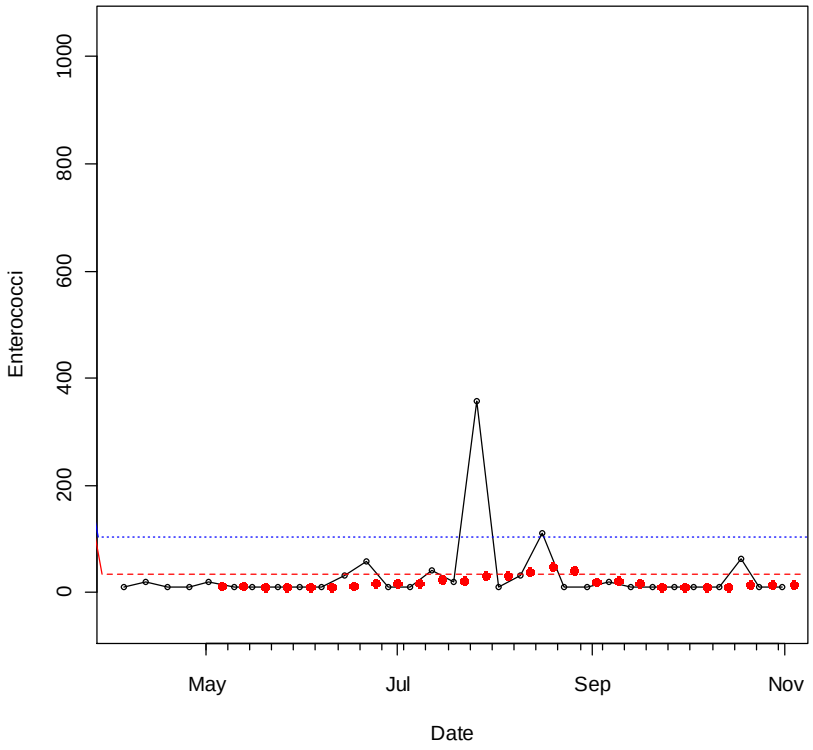
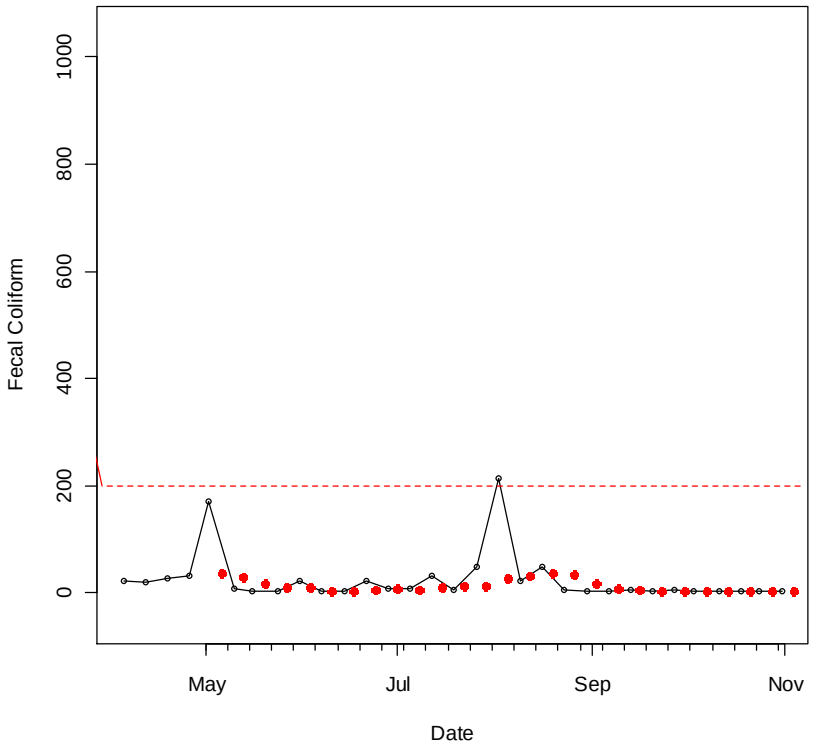


Figure B.8. Time series of sample results collected during 2011 at GIB2.

A



B

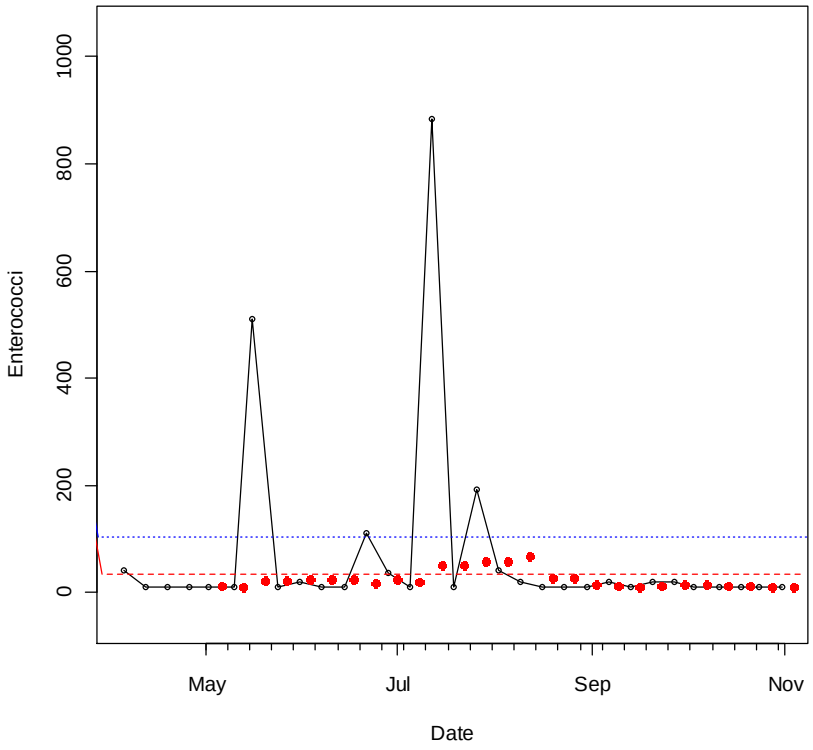
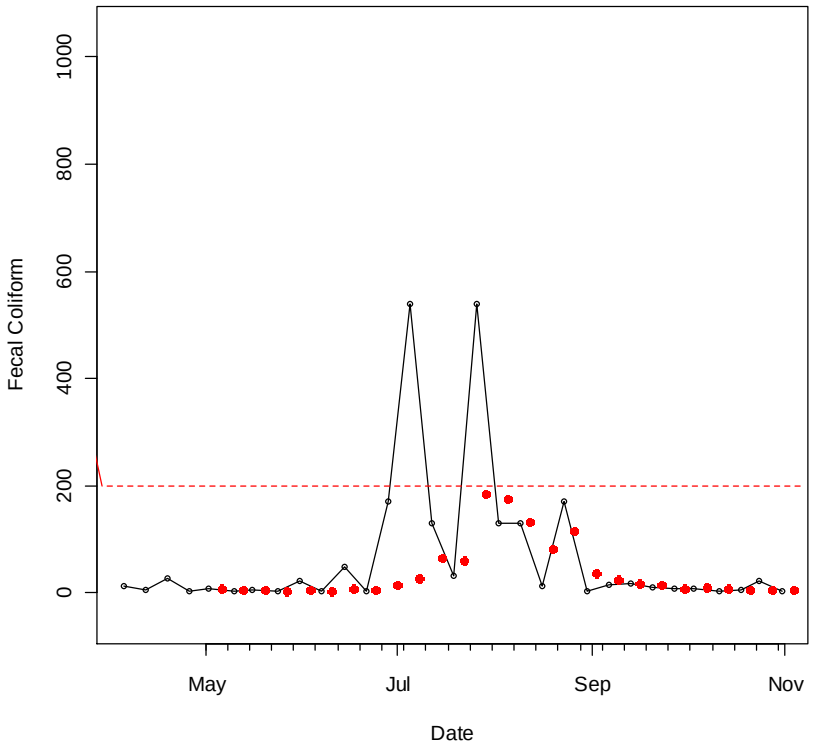


Figure B.9. Time series of sample results collected during 2011 at GIB3.

A



B

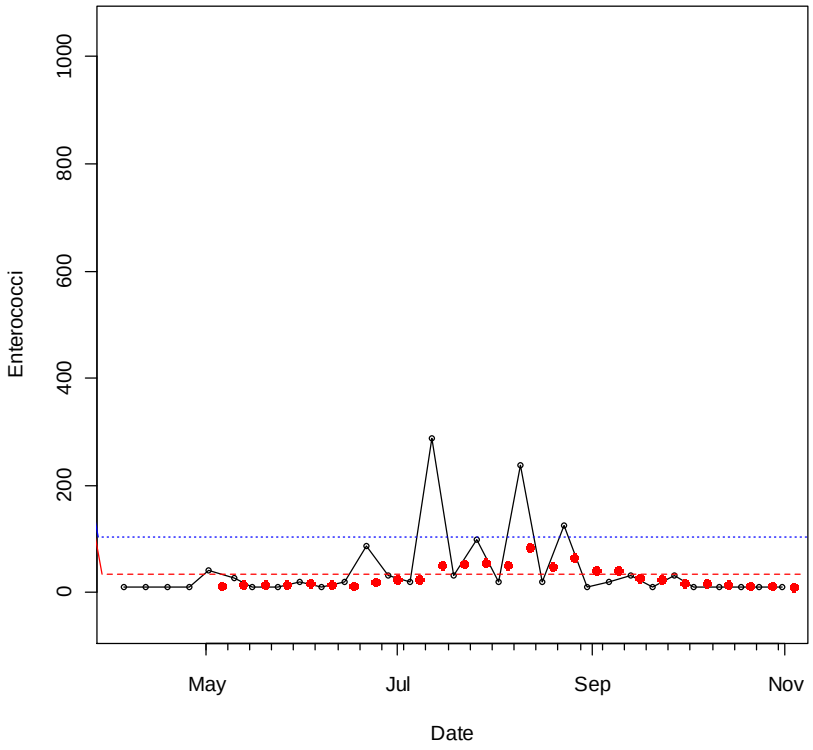
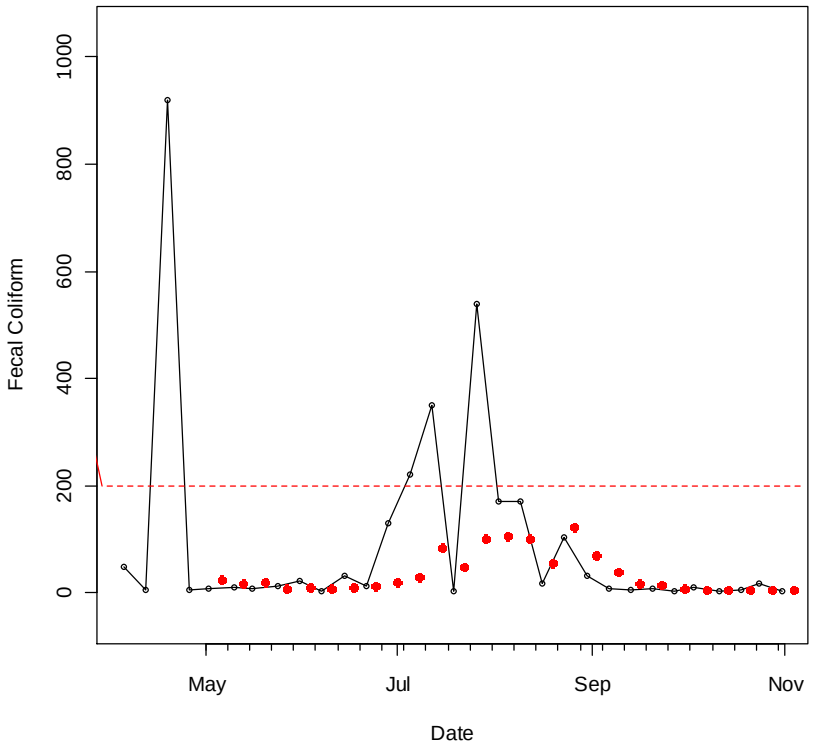


Figure B.13. Time series of sample results collected during 2011 at GISP1.

A



B

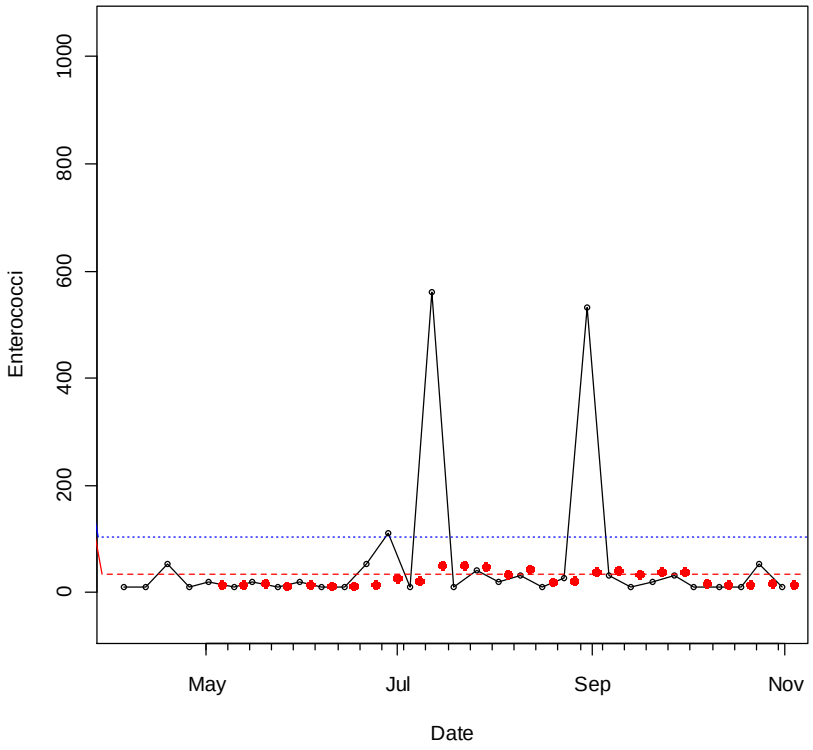
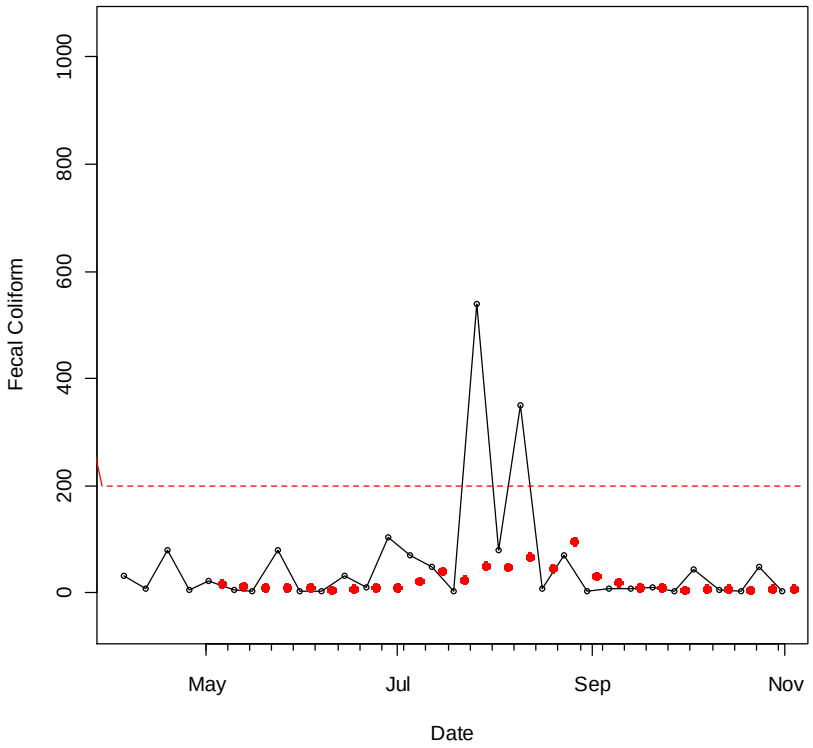


Figure B.10. Time series of sample results collected during 2011 at GISP2.

A



B

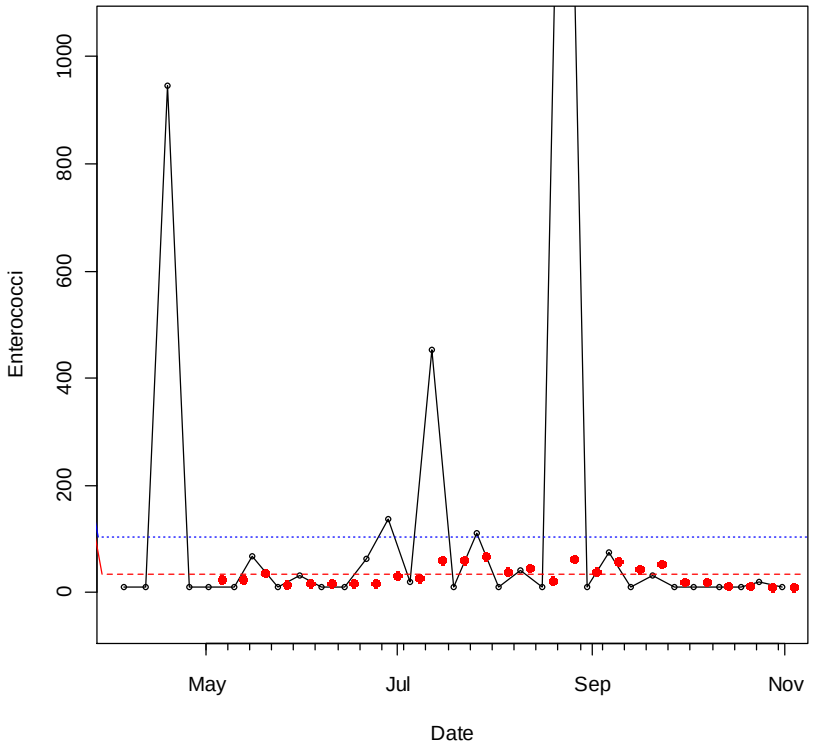
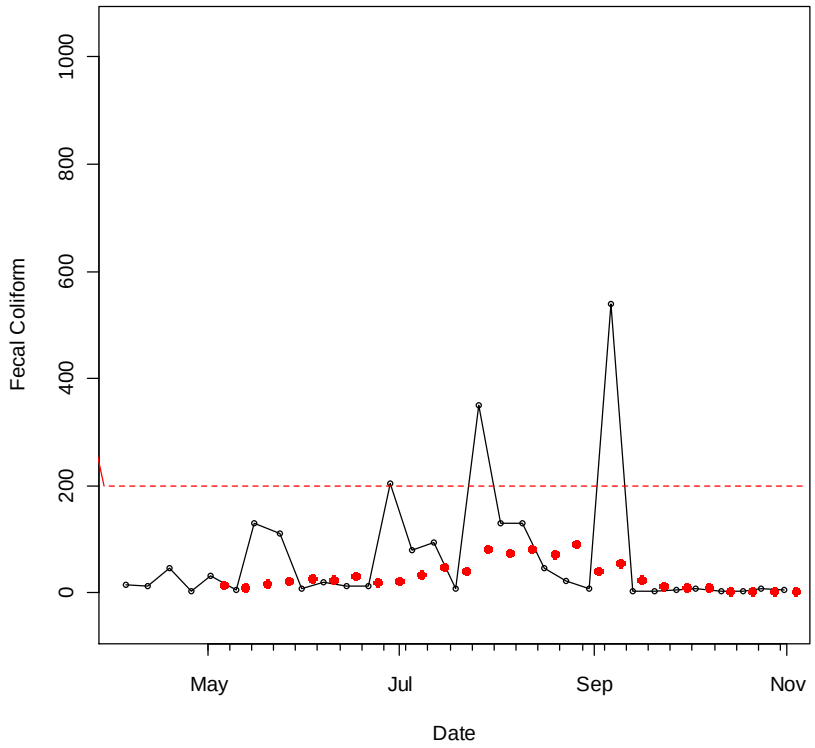


Figure B.11. Time series of sample results collected during 2011 at GISP3.

A



B

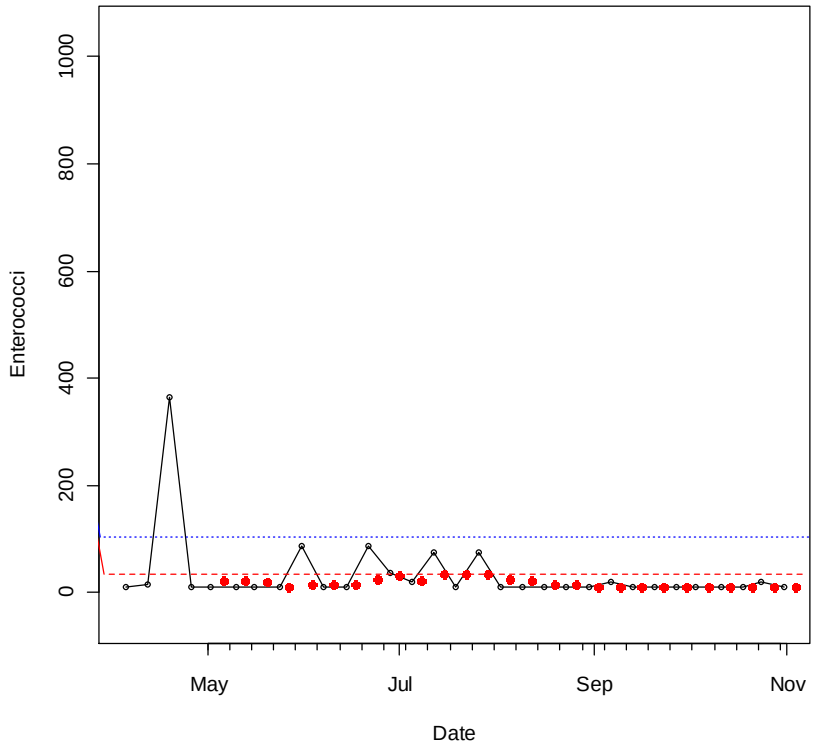
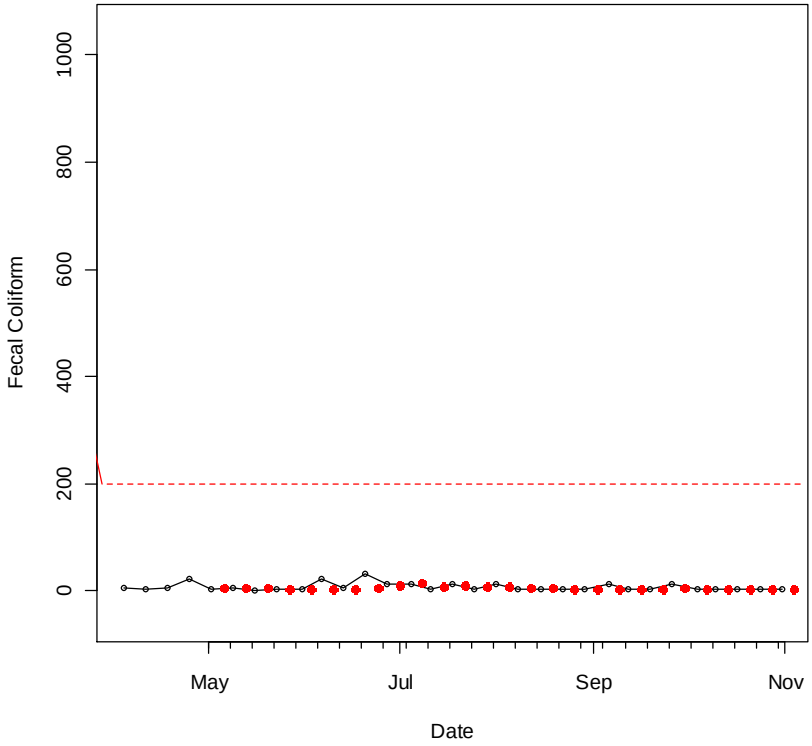


Figure B.12. Time series of sample results collected during 2011 at GISP4.

A



B

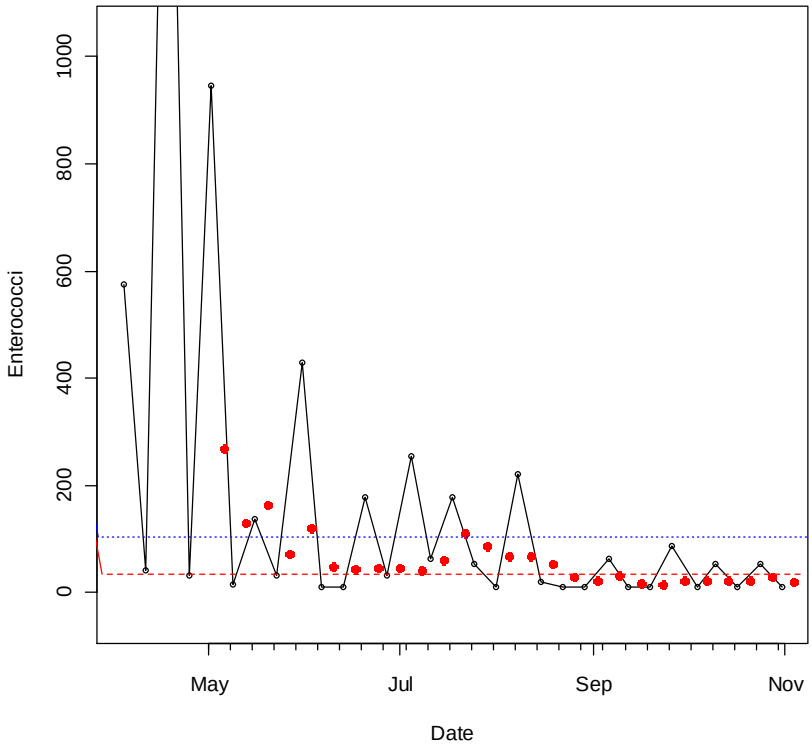
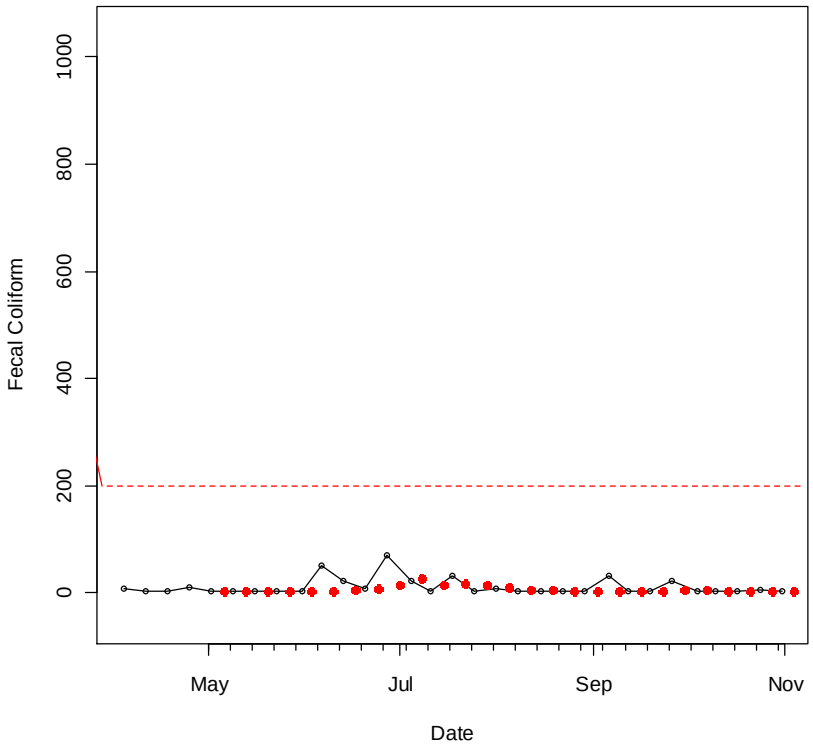


Figure B.13. Time series of sample results collected during 2011 at HOLLY1.

A



B

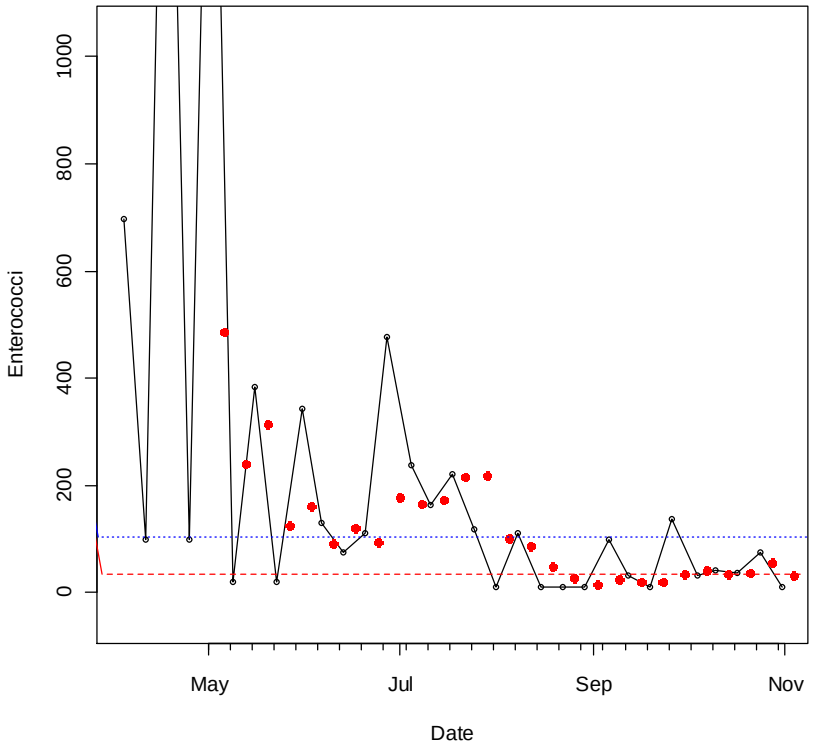
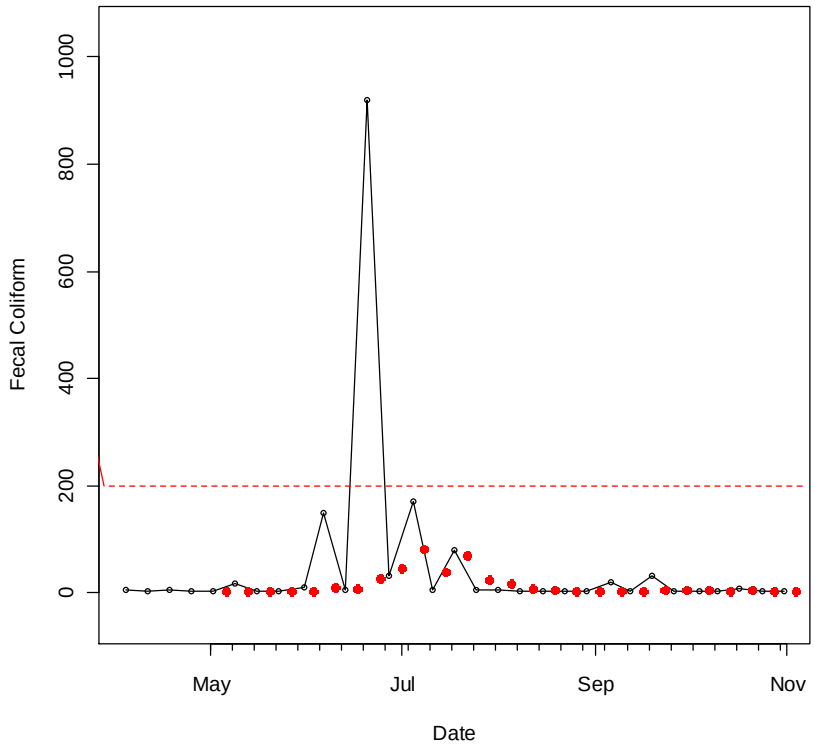


Figure B.14. Time series of sample results collected during 2011 at HOLLY2.

A



B

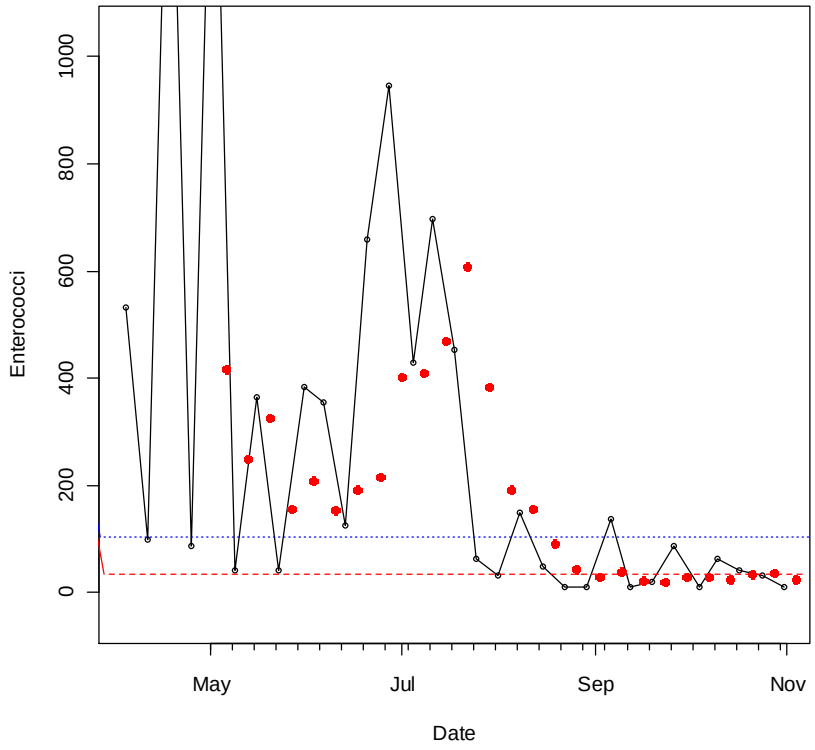
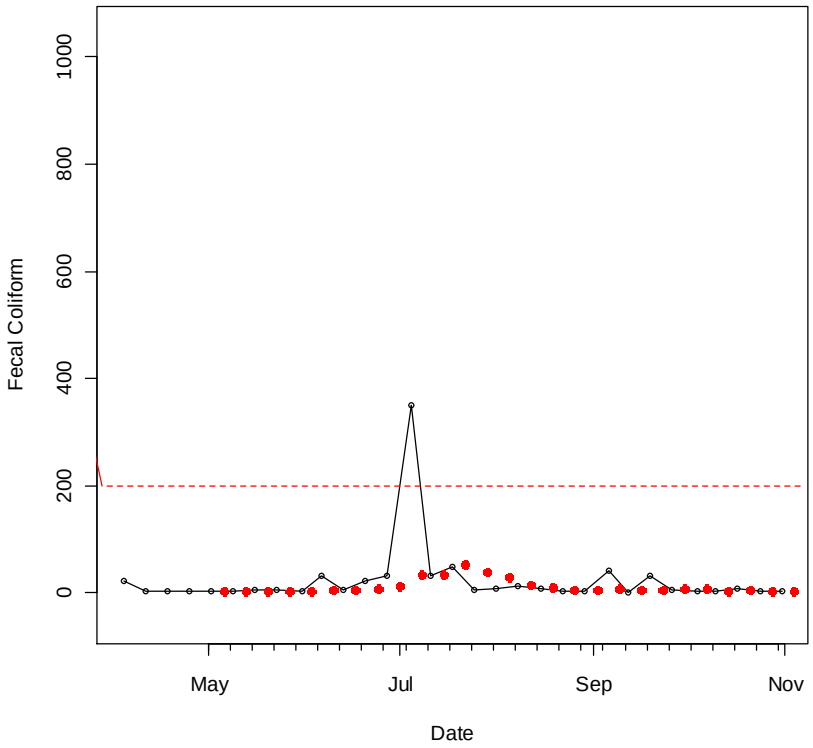


Figure B.15. Time series of sample results collected during 2011 at HOLLY3.

A



B

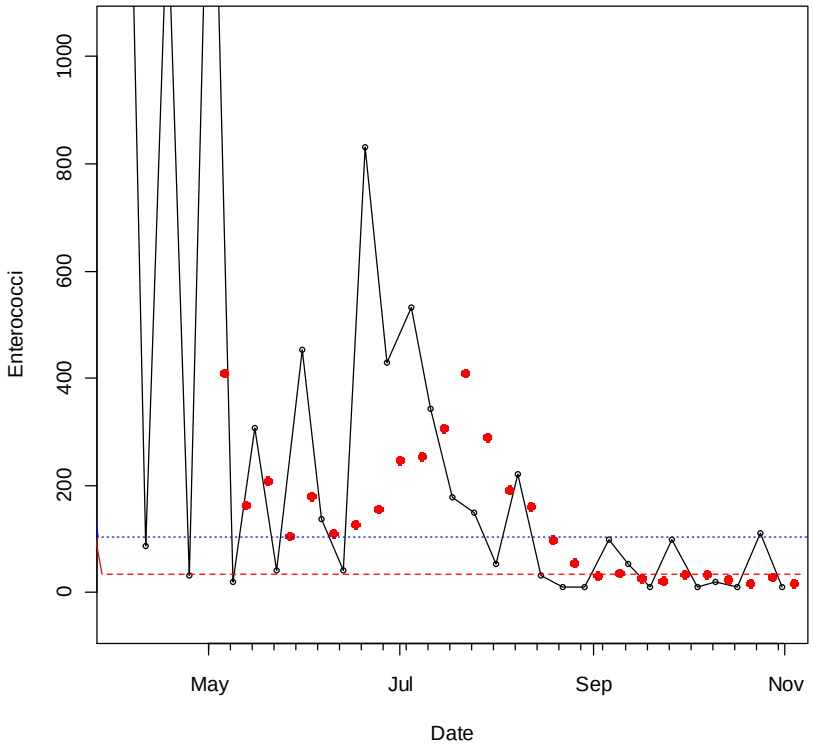
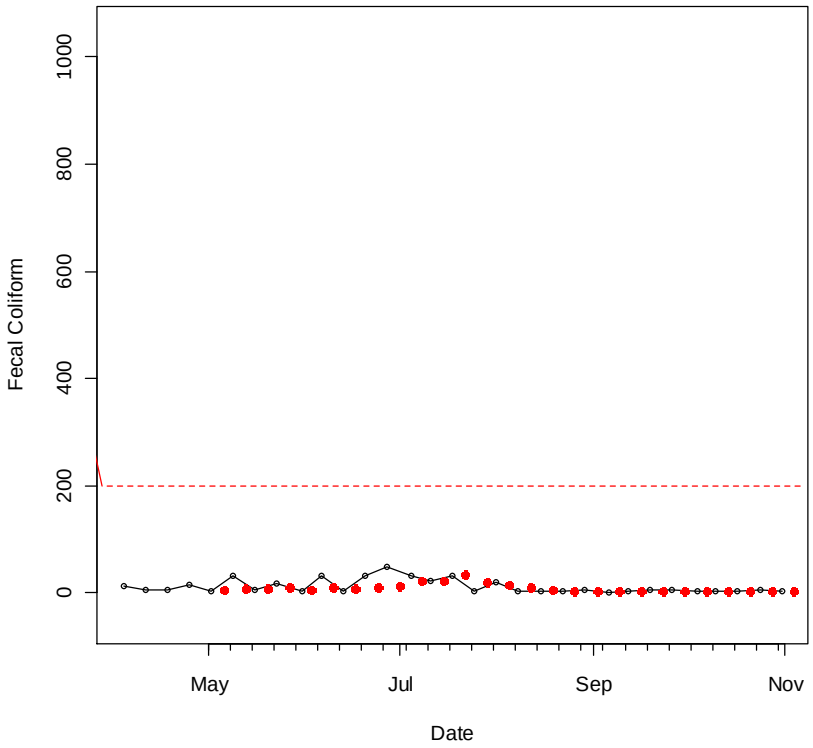


Figure B.16. Time series of sample results collected during 2011 at HOLLY4.

A



B

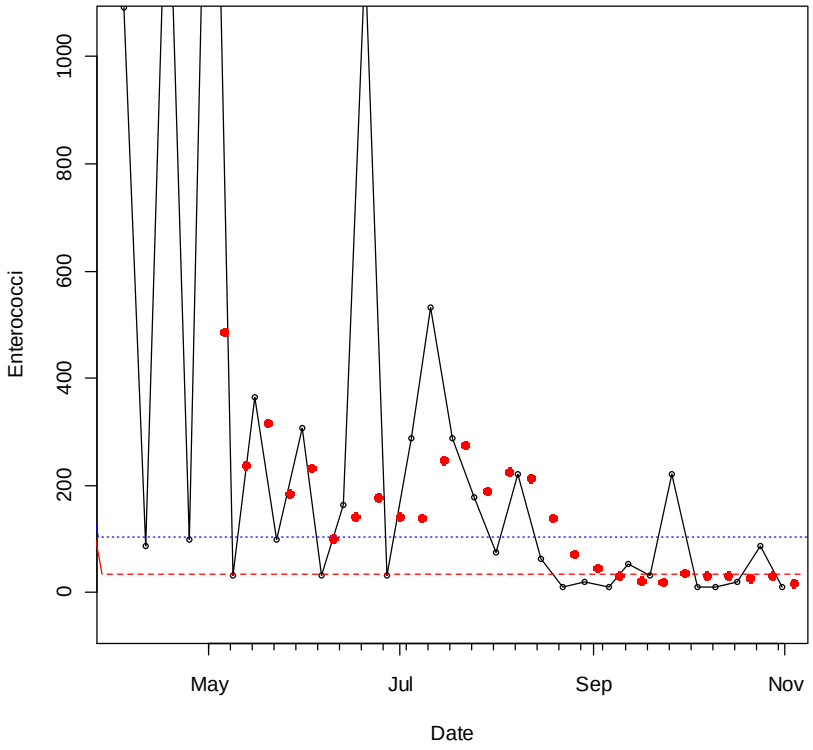
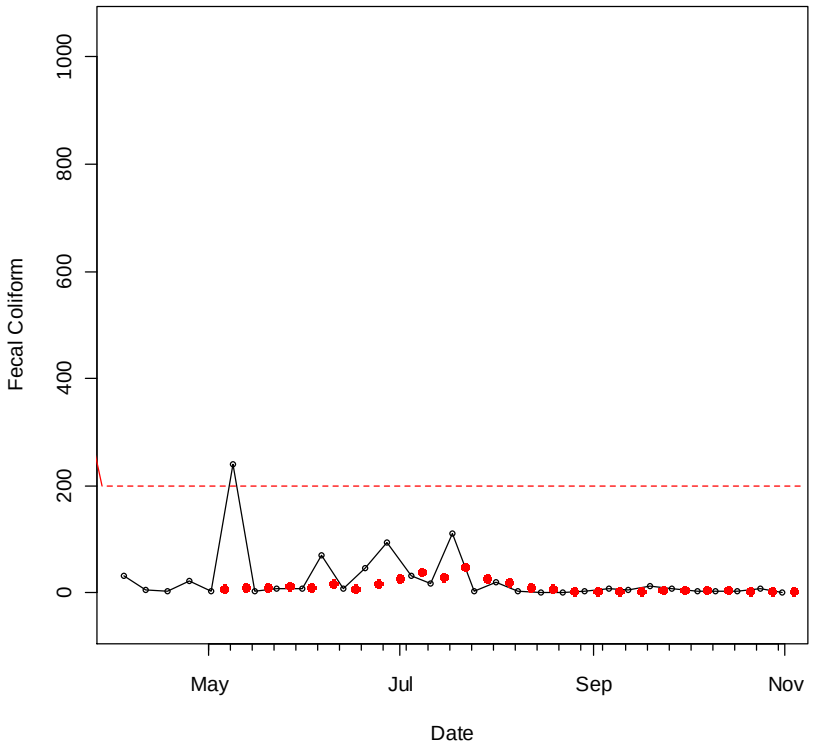


Figure B.17. Time series of sample results collected during 2011 at HOLLY5.

A



B

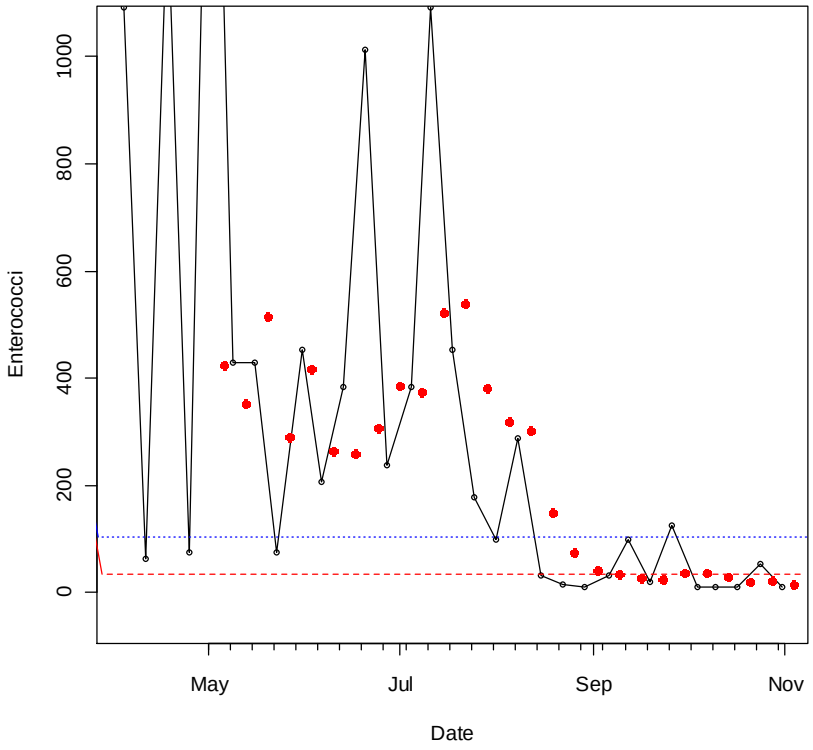
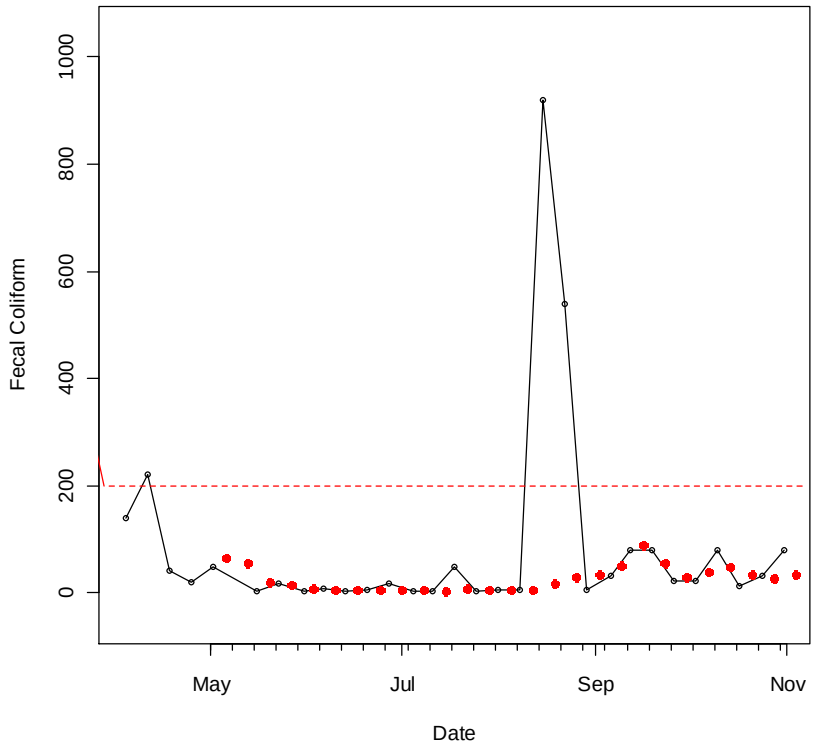


Figure B.18. Time series of sample results collected during 2011 at HOLLY6.

A



B

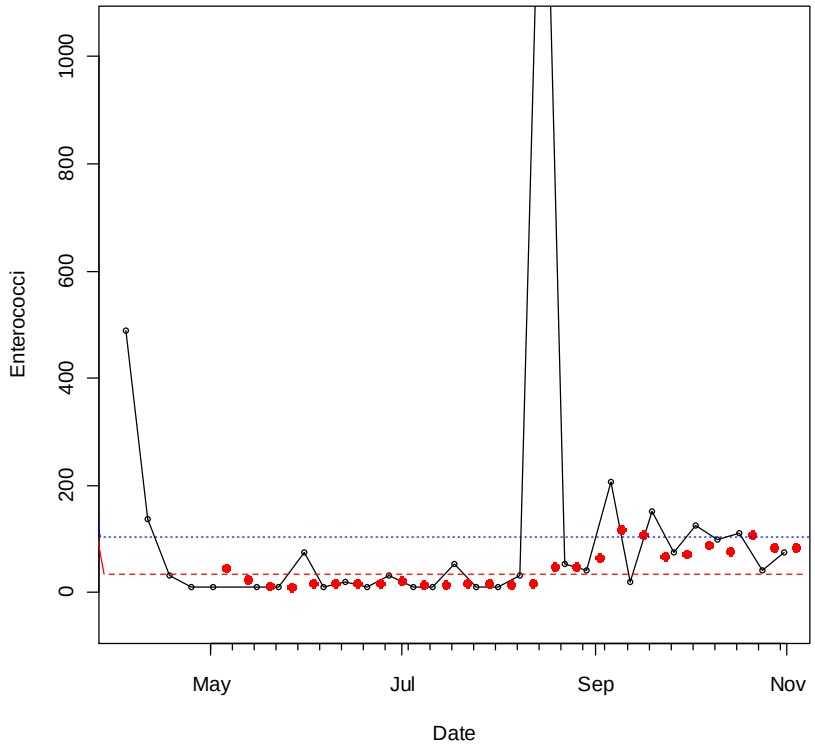
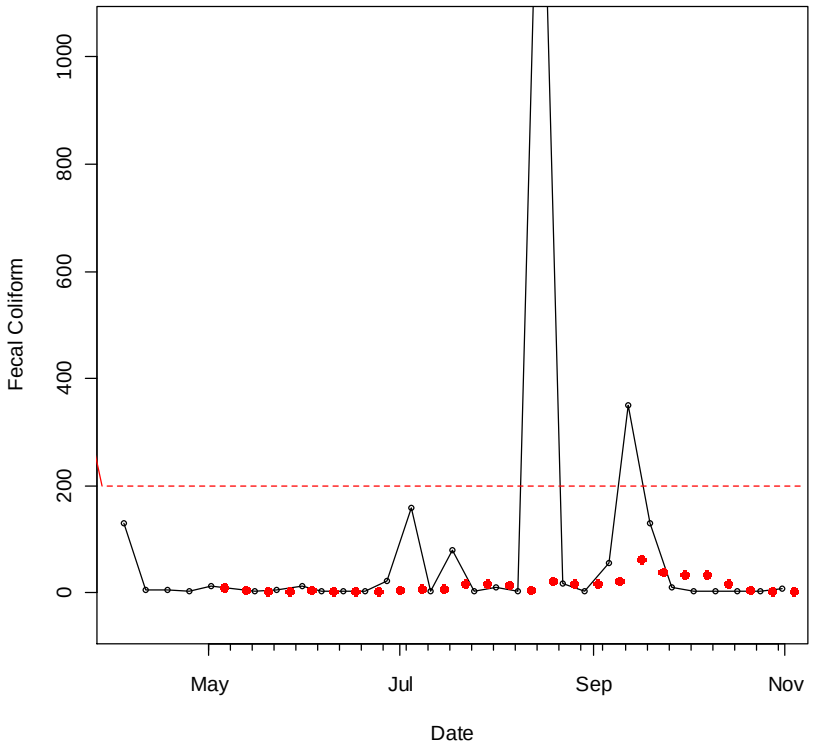


Figure B.19. Time series of sample results collected during 2011 at LCNB1.

A



B

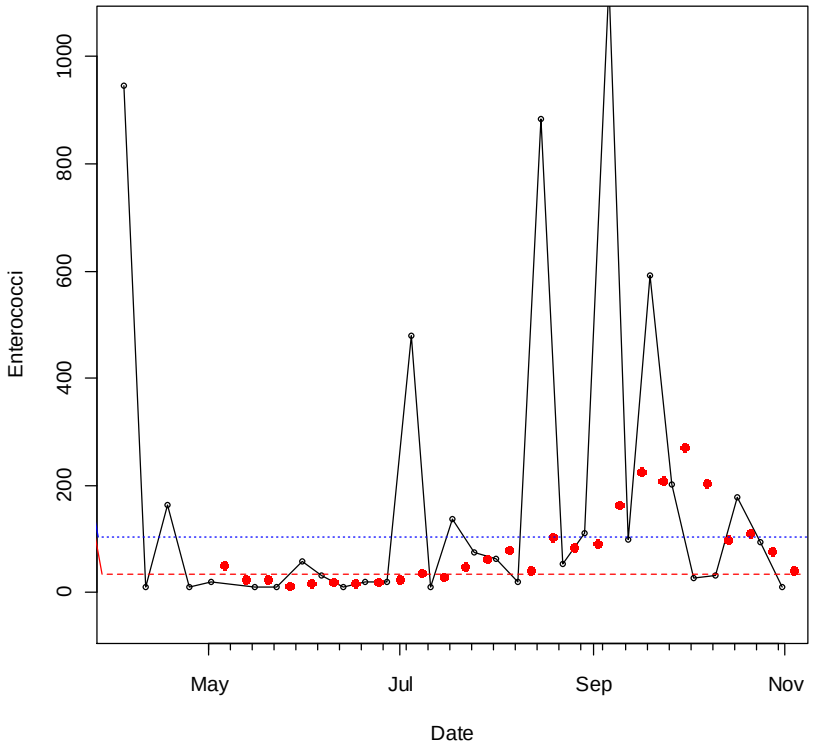
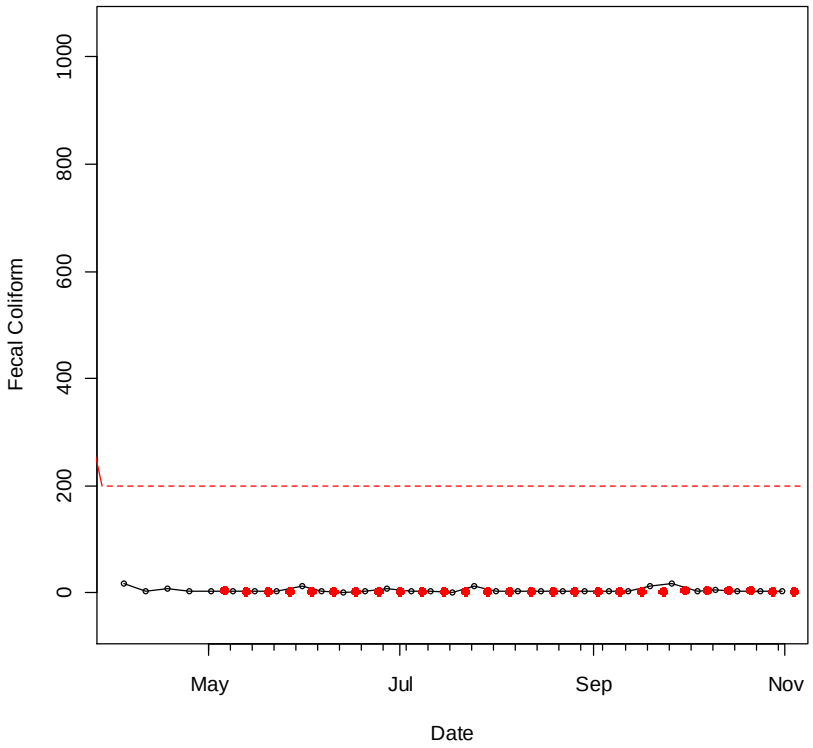


Figure B.20. Time series of sample results collected during 2011 at LCSB1.

A



B

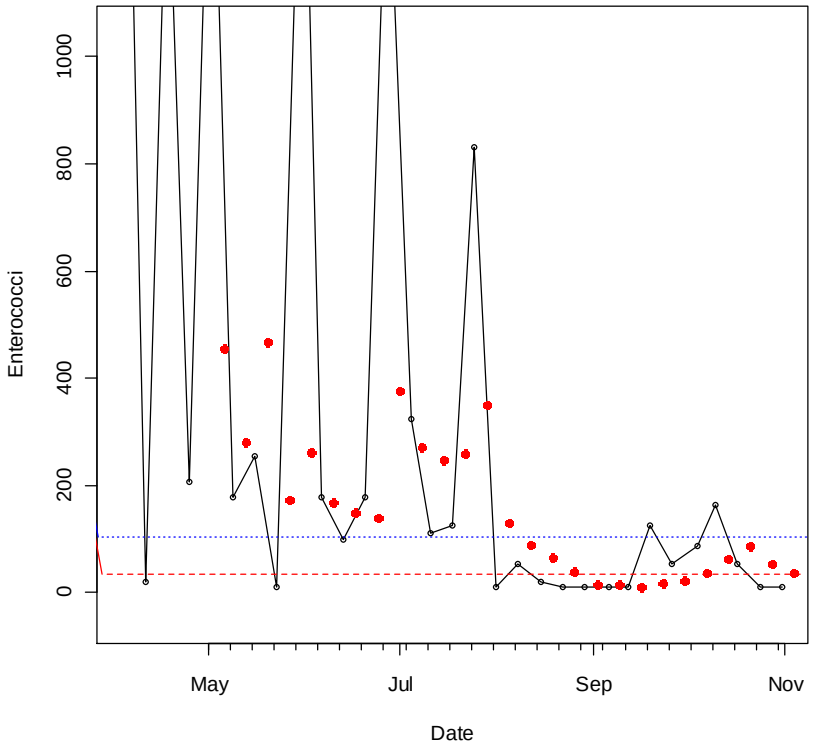
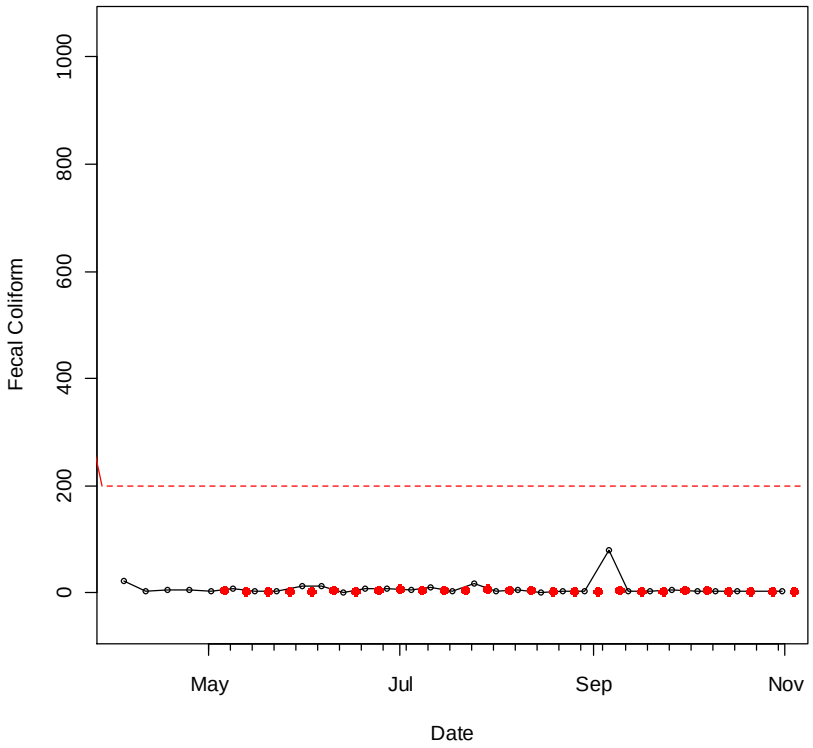


Figure B.21. Time series of sample results collected during 2011 at LTFL1.

A



B

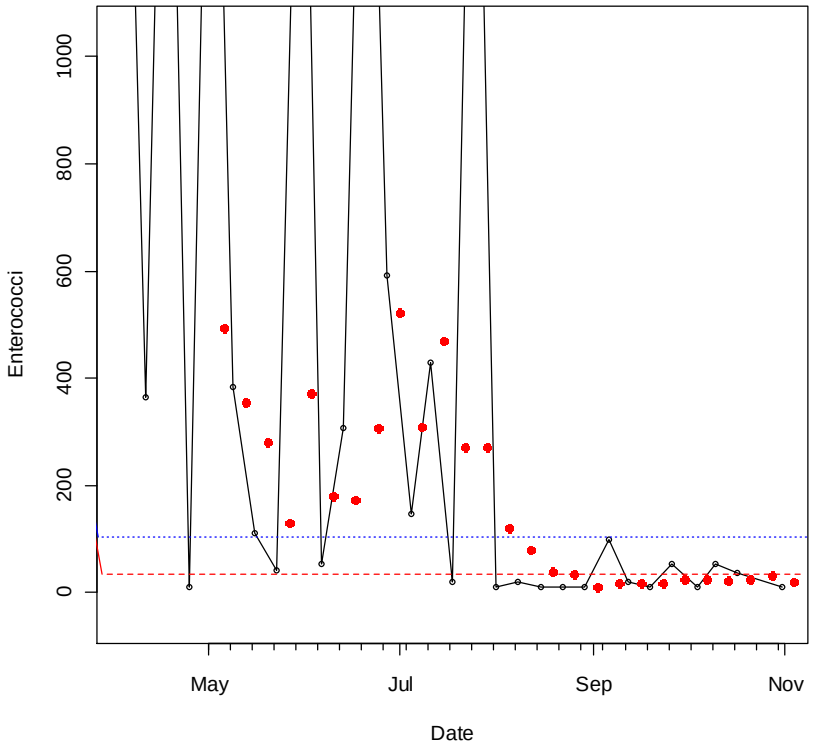
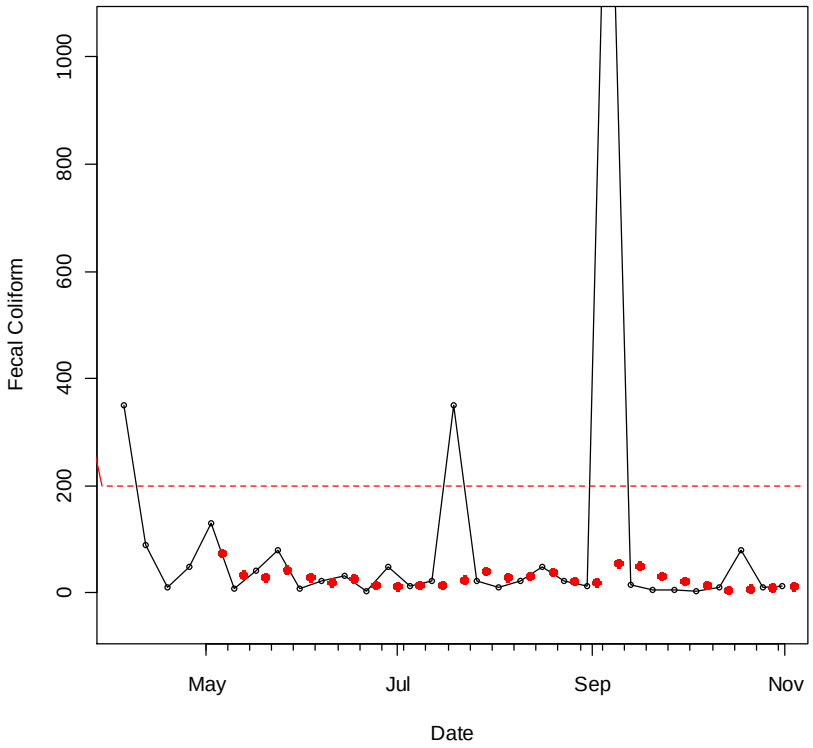


Figure B.22. Time series of sample results collected during 2011 at MART1.

A



B

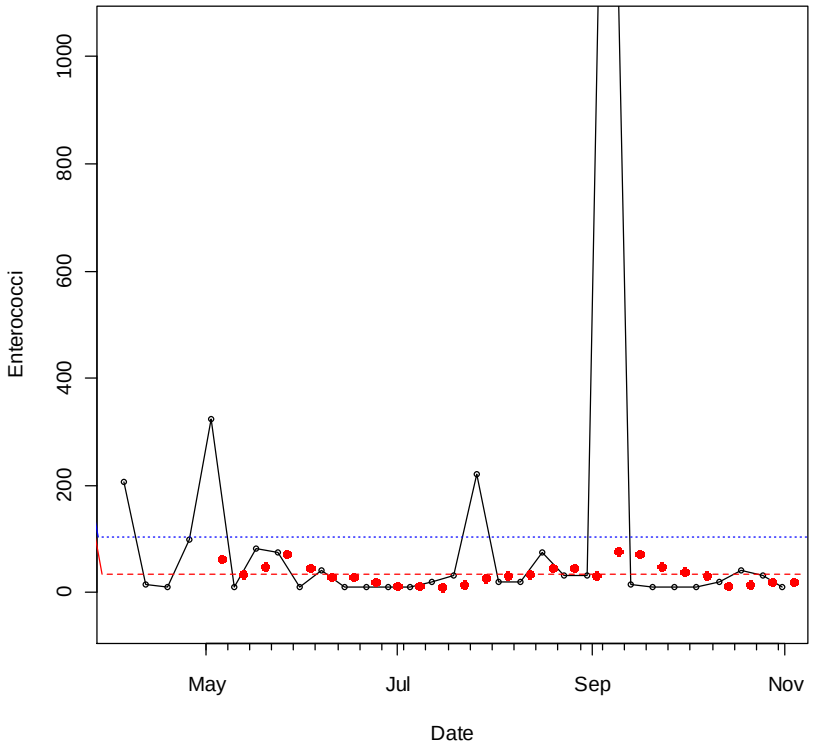
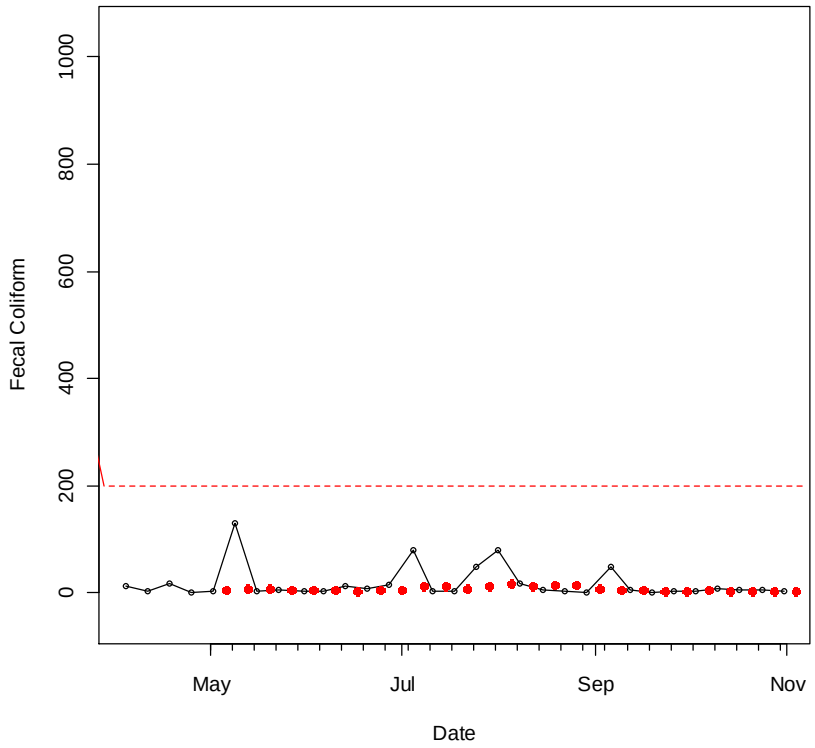


Figure B.23. Time series of sample results collected during 2011 at PONT1.

A



B

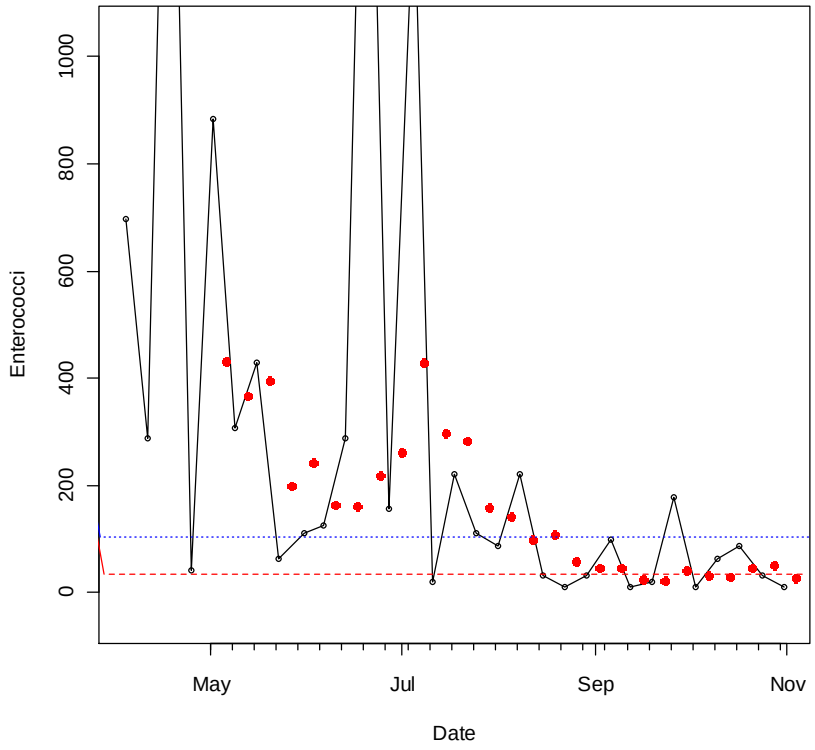


Figure B.24. Time series of sample results collected during 2011 at RUTH1.

APPENDIX C

Sample Results

2011Beach Sample Results

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
Constance Beach											
CNST1	***Beach Name** Constance Beach*										
	4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	33	2005	21.9	Routine
	4/11/2011	7:46	Normal	Cloudy	Southwest	Moderate (10-15 mph)	72	2	20	12.7	Routine
	4/18/2011	7:45	High Tide Falling	Partly Cloudy	Southeast	Moderate (10-15 mph)	74	2	782	31.1	Routine
	4/25/2011	7:45	Normal	Partly Cloudy	South	Strong (20-35 mph)	76	4.5	15	13.9	Routine
	5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	2005	30.2	Routine
	5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	33	124	21.9	Routine
	5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	74	2	137	29.7	Routine
	5/23/2011	8:00	High Tide Falling	Scattered Clouds	South	Moderate (10-15 mph)	76	2	20	21.7	Routine
	5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	7.8	2005	17.5	Routine
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	2	560	15.7	Routine
	6/13/2011	8:15	Normal	Scattered Clouds	West	Light (0-5 mph)	82	2	75	13.8	Routine
	6/20/2011	7:30	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	82	2	207	32.2	Routine
	6/27/2011	8:00	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	82	7.8	560	12.0	Routine
	7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	6.8	659	27.2	Routine
	7/11/2011	7:30	Normal	Scattered Clouds	South	Light (0-5 mph)	86	2	591	29.8	Routine
	7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	7.8	99	35.0	Field Duplicate
	7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	7.8	75	35.0	Routine
	7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	13	207	35.0	Routine
	8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	4.5	10	25.4	Routine
	8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	2	124	35.0	Routine
	8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	4.5	20	35.0	Field Duplicate
	8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	2	10	35.0	Routine
	8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	2	87	35.0	Routine
	8/29/2011	8:00	Low Tide Falling	Clear	East	Light (0-5 mph)	88	2	20	22.3	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	6.8	31	32.2	Routine
	9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	2	53	32.6	Routine
	9/19/2011	8:00	Normal	Light Rain	East-Southeast	Light (0-5 mph)	80	33	87	31.5	Routine
	9/26/2011	7:40	Low Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	80	11	10	32.0	Routine

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	10	34.8	Routine
	10/10/2011	8:30	Normal	Cloudy	East-Northeast	Moderate (10-15 mph)	76	2	111	21.5	Routine
	10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	9.3	75	28.6	Routine
	10/24/2011	8:00	Low Tide Falling	Scattered Clouds	North	Light (0-5 mph)	75	4.5	31	30.8	Routine
	10/31/2011	8:30	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	66	2	10	31.0	Routine
Cypremort Point State Park											
CYPT1	***Beach Name*** *Cypremort Point State Park*										
	4/4/2011	7:30	High Tide	Cloudy	South	Strong (20-35 mph)	72	23	782	4.6	Field Split
	4/4/2011	7:30	High Tide	Cloudy	South	Strong (20-35 mph)	72	22	1445	4.5	Routine
	4/11/2011	7:15	Low Tide Falling	Partly Cloudy	Southwest	Moderate (10-15 mph)	73	170	504	3.8	Routine
	4/18/2011	7:17	High Tide Falling	Cloudy	South-Southeast	Moderate (10-15 mph)	72	7.8	64	4.2	Routine
	4/25/2011	7:20	Low Tide Falling	Partly Cloudy	East-Southeast	Strong (20-35 mph)	83	1.8	10	4.4	Routine
	5/2/2011	7:15	High Tide	Partly Cloudy	East	Moderate-Light (5-10 mph)	74	23	31	3.2	Routine
	5/9/2011	7:15	Low Tide Falling	Scattered Clouds	Calm	Calm (0 mph)	74	2	10	3.3	Routine
	5/16/2011	7:13	High Tide Falling	Scattered Clouds	North	Moderate (10-15 mph)	72	4.5	10	2.3	Routine
	5/23/2011	7:10	Low Tide Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	78	7.8	42	2.4	Routine
	5/31/2011	7:10	High Tide	Scattered Clouds	East	Light (0-5 mph)	80	23	10	2.4	Routine
	6/6/2011	7:10	Low Tide	Clear	Calm	Calm (0 mph)	82	2	20	2.1	Routine
	6/13/2011	7:15	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	82	13	1445	2.3	Routine
	6/20/2011	7:10	High Tide Rising	Partly Cloudy	South	Moderate-Strong (15-20 mph)	83	49	429	1.7	Routine
	6/27/2011	7:15	High Tide	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	85	17	453	2.4	Routine
	7/5/2011	7:10	High Tide Falling	Partly Cloudy	North-Northeast	Light (0-5 mph)	86	7.8	560	0.8	Routine
	7/11/2011	7:15	High Tide Falling	Partly Cloudy	Southeast	Light (0-5 mph)	88	4	178	1.8	Routine
	7/18/2011	7:10	High Tide Falling	Cloudy	South	Moderate (10-15 mph)	86	17	75	1.2	Routine
	7/25/2011	7:15	High Tide	Rain	South-Southeast	Moderate-Strong (15-20 mph)	82	4.5	99	1.2	Routine
	8/1/2011	7:30	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	85	9.2	406	1.7	Routine
	8/1/2011	7:30	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	85	4	453	1.7	Field Duplicate
	8/8/2011	7:10	High Tide	Cloudy	South	Moderate-Strong (15-20 mph)	86	33	364	1.4	Routine
	8/15/2011	7:08	High Tide Falling	Clear	North	Light (0-5 mph)	88	4.5	738	2.2	Routine
	8/22/2011	7:10	High Tide Falling	Clear	East	Light (0-5 mph)	88	2	10	15.9	Routine
	8/29/2011	7:15	Low Tide Falling	Clear	North	Light (0-5 mph)	88	13	87	14.8	Routine
	9/6/2011	7:15	High Tide Falling	Clear	North	Light (0-5 mph)	75	79	150	6.9	Routine
	9/12/2011	7:15	High Tide Falling	Clear	Calm	Calm (0 mph)	84	4.5	20	6.0	Routine

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	9/19/2011	7:10	High Tide Falling	Light Rain	East	Moderate-Light (5-10 mph)	82	17	624	7.1	Routine
	9/26/2011	7:10	High Tide	Clear	South	Moderate (10-15 mph)	82	79	945	7.0	Routine
	10/3/2011	7:15	High Tide Falling	Clear	North	Light (0-5 mph)	74	2	10	7.0	Routine
	10/10/2011	7:15	High Tide Falling	Clear	North	Light (0-5 mph)	74	2	20	9.5	Routine
	10/17/2011	7:17	High Tide Falling	Clear	Calm	Calm (0 mph)	74	33	99	8.7	Routine
	10/24/2011	7:20	Low Tide	Clear	Southeast	Light (0-5 mph)	70	1.8	20	10.1	Routine
	10/31/2011	7:15	Low Tide Falling	Clear	North	Moderate-Light (5-10 mph)	68	2	10	10.4	Routine
Fontainebleau State Park											
FNTB1			***Beach Name*** *Fontainebleau State Park*								
	4/5/2011	10:15	Low Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	62.96	240	53	4.7	Routine
	4/12/2011	9:50	High Tide Falling	Clear	North	Moderate (10-15 mph)	72.5	23	10	4.3	Routine
	4/19/2011	9:20	Low Tide	Cloudy	South	Moderate-Light (5-10 mph)	74.6	70	31	4.7	Routine
	4/26/2011	9:00	Low Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	76.1	79	75	5.1	Routine
	5/3/2011	9:15	Low Tide Falling	Cloudy	South	Moderate (10-15 mph)	76.46	49	344	6.8	Routine
	5/10/2011	9:00	Low Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	80.6	79	10	5.7	Routine
	5/17/2011	9:45	High Tide	Scattered Clouds	North	Light (0-5 mph)	70.8	23	20	5.1	Routine
	5/24/2011	8:45	Low Tide	Clear	South	Moderate-Light (5-10 mph)	81.3	33	10	2.5	Field Duplicate
	5/24/2011	8:45	Low Tide	Clear	South	Moderate-Light (5-10 mph)	81.32	33	20	2.5	Routine
	5/31/2011	8:50	Low Tide	Partly Cloudy	Southeast	Light (0-5 mph)	85.66	7.8	20	1.6	Routine
	6/7/2011	9:15	Low Tide	Clear	West-Northwest	Light (0-5 mph)	82.58	23	53	1.4	Routine
	6/14/2011	9:00	Low Tide Falling	Clear	West-Southwest	Moderate-Light (5-10 mph)	83.3	140	2005	1.7	Routine
	6/21/2011	9:35	Low Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	81.86	130	2005	2.2	Routine
	6/28/2011	9:10	Low Tide Falling	Partly Cloudy	South-Southwest	Light (0-5 mph)	86.36	13	64	1.5	Routine
	7/6/2011	9:00	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	85.46	33	10	0.4	Routine
	7/13/2011	9:15	Low Tide Falling	Partly Cloudy	West	Light (0-5 mph)	85.28	46	10	0.4	Routine
	7/19/2011	9:40	Low Tide	Partly Cloudy	East-Southeast	Light (0-5 mph)	83.48	21	20	0.4	Routine
	7/26/2011	9:00	Low Tide Falling	Cloudy	West-Southwest	Light (0-5 mph)	80.78	79	531	0.6	Routine
	8/2/2011	9:00	Low Tide	Cloudy	West-Southwest	Light (0-5 mph)	86.9	46	10	1.5	Routine
	8/10/2011	9:20	Low Tide Falling	Clear	Southwest	Moderate-Light (5-10 mph)	84.74	49	64	1.5	Routine
	8/16/2011	9:05	High Tide Falling	Clear	East-Northeast	Moderate-Light (5-10 mph)	82.4	33	64	0.5	Routine
	8/23/2011	9:10	Low Tide Falling	Clear	Calm	Calm (0 mph)	88.34	4	10	1.6	Routine
	8/30/2011	9:10	High Tide Falling	Clear	West-Southwest	Light (0-5 mph)	85.46	7.8	406	1.7	Routine
	9/7/2011	8:55	Low Tide Falling	Clear	East-Northeast	Moderate-Light (5-10 mph)	73.4	7.8	20	9.3	Routine

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	9/13/2011	9:20	High Tide	Clear	Calm	Calm (0 mph)	79.52	70	20	1.7	Routine
	9/20/2011	9:20	Low Tide Falling	Cloudy	Northeast	Light (0-5 mph)	79.7	33	10	3.1	Routine
	9/27/2011	9:15	High Tide	Partly Cloudy	West	Moderate-Light (5-10 mph)	81.5	23	31	3.2	Routine
	10/4/2011	9:00	Low Tide Falling	Clear	Calm	Calm (0 mph)	69.62	4.5	10	2.7	Routine
	10/12/2011	9:30	High Tide Falling	Partly Cloudy	Northeast	Light (0-5 mph)	73.04	23	1184	3.6	Routine
	10/18/2011	9:10	High Tide Rising	Partly Cloudy	East	Light (0-5 mph)	75.56	79	10	3.7	Routine
	10/18/2011	9:10	High Tide Rising	Partly Cloudy	East	Light (0-5 mph)	75.56	33	10	3.8	Field Duplicate
	10/25/2011	9:35	High Tide Falling	Clear	East-Northeast	Light (0-5 mph)	67.1	2	10	3.9	Routine
	10/31/2011	8:45	High Tide Falling	Clear	Northeast	Light (0-5 mph)	60.62	49	10	3.9	Routine
Fourchon											
FOUR1	***Beach Name*** *Fourchon - 1*										
	4/5/2011	8:06	Low Tide	Clear	North	Strong (20-35 mph)	62	20	20	31.1	Routine
	4/12/2011	6:14	Low Tide Falling	Clear	North	Moderate-Strong (15-20 mph)	68	2	10	29.7	Routine
	4/19/2011	6:17	High Tide Rising	Clear	Southeast	Moderate (10-15 mph)	74	2	10	28.6	Routine
	4/26/2011	6:10	Low Tide Falling	Cloudy	South	Moderate (10-15 mph)	76	2	10	18.6	Routine
	5/2/2011	6:23	High Tide Rising	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	76	7.8	10	20.2	Routine
	5/10/2011	6:21	Low Tide Falling	Clear	South	Light (0-5 mph)	78	7.8	10	24.3	Routine
	5/16/2011	6:53	High Tide Rising	Partly Cloudy	North	Light (0-5 mph)	72	2	10	28.8	Routine
	5/24/2011	6:32	Low Tide Falling	Partly Cloudy	Southeast	Light (0-5 mph)	80	4.5	10	16.1	Routine
	5/31/2011	6:42	High Tide Rising	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	81	4.5	75	16.4	Routine
	6/7/2011	6:28	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	82	2	10	21.6	Routine
	6/14/2011	6:12	Normal	Partly Cloudy	Northeast	Light (0-5 mph)	82	23	10	19.6	Routine
	6/21/2011	6:18	High Tide Rising	Rain	South	Moderate (10-15 mph)	82	4.5	20	23.5	Routine
	6/28/2011	6:15	High Tide Rising	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	2	10	19.5	Routine
	7/5/2011	6:12	Normal	Scattered Clouds	Calm	Calm (0 mph)	86	2	10	18.7	Routine
	7/12/2011	6:12	High Tide Rising	Light Rain	South	Light (0-5 mph)	86	4	10	24.6	Routine
	7/19/2011	6:27	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	80	4.5	75	27.2	Routine
	7/26/2011	6:29	High Tide Rising	Cloudy	West	Light (0-5 mph)	82	49	42	15.2	Routine
	8/2/2011	6:08	Low Tide Falling	Rain	South-Southwest	Light (0-5 mph)	84	2	10	25.6	Routine
	8/9/2011	6:38	High Tide	Partly Cloudy	South	Light (0-5 mph)	82	23	10	33.9	Routine
	8/9/2011	6:38	High Tide	Partly Cloudy	South	Light (0-5 mph)	82	130	10	33.8	Field Duplicate
	8/16/2011	7:33	Normal	Partly Cloudy	Northwest	Light (0-5 mph)	84	13	10	31.3	Routine
	8/23/2011	6:34	High Tide	Scattered Clouds	North	Light (0-5 mph)	89	4.5	10	18.9	Routine

Beach / Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero-cocci	Salinity	Sample Type
	8/23/2011	6:34	High Tide	Scattered Clouds	North	Light (0-5 mph)	89	7.8	31	18.5	Field Duplicate
	8/30/2011	6:32	Normal	Clear	Calm	Calm (0 mph)	84	2	10	30.3	Routine
	9/6/2011	6:28	High Tide Falling	Scattered Clouds	North	Moderate-Light (5-10 mph)	76	4.5	10	35.0	Routine
	9/13/2011	7:17	Normal	Clear	Calm	Calm (0 mph)	80	2	10	30.3	Routine
	9/20/2011	6:38	Low Tide Falling	Scattered Clouds	Northeast	Light (0-5 mph)	78	2	10	25.1	Routine
	9/27/2011	6:38	Normal	Scattered Clouds	West	Light (0-5 mph)	78	2	64	30.1	Field Split
	9/27/2011	6:38	Normal	Scattered Clouds	West	Light (0-5 mph)	78	2	53	29.9	Routine
	10/3/2011	6:39	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	68	2	10	26.8	Routine
	10/11/2011	7:00	Low Tide	Scattered Clouds	Northeast	Light (0-5 mph)	72	2	10	25.3	Routine
	10/18/2011	7:32	High Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	76	4.5	42	27.2	Routine
	10/24/2011	6:58	Low Tide	Cloudy	Calm	Calm (0 mph)	69	11	10	30.7	Routine
	10/31/2011	8:18	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	63	2	10	29.5	Routine
Grand Isle Beach											
GIB1	***Beach Name*** *Grand Isle Beach - 1*										
	4/5/2011	8:06	Low Tide	Clear	North	Strong (20-35 mph)	62	7.8	10	18.3	Routine
	4/12/2011	6:14	Low Tide Falling	Clear	North	Moderate-Strong (15-20 mph)	66	4.5	10	26.4	Routine
	4/19/2011	6:17	High Tide Rising	Clear	Southeast	Moderate (10-15 mph)	74	3.7	20	24.9	Routine
	4/19/2011	6:17	High Tide Rising	Clear	Southeast	Moderate (10-15 mph)	74	2	10	25.0	Field Split
	4/26/2011	6:10	Low Tide Falling	Cloudy	South	Moderate (10-15 mph)	76	33	10	16.0	Routine
	5/2/2011	6:23	High Tide Rising	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	76	46	10	18.2	Routine
	5/10/2011	6:21	Low Tide Falling	Clear	South	Light (0-5 mph)	76	4.5	10	18.3	Routine
	5/16/2011	6:53	High Tide Rising	Partly Cloudy	North	Light (0-5 mph)	72	4.5	10	34.4	Routine
	5/24/2011	6:32	Low Tide Falling	Partly Cloudy	Southeast	Light (0-5 mph)	79	6.8	10	14.2	Routine
	5/31/2011	6:42	High Tide Rising	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	81	2	31	15.1	Routine
	6/7/2011	6:28	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	82	1.8	10	16.9	Routine
	6/14/2011	6:12	Normal	Partly Cloudy	Northeast	Light (0-5 mph)	82	7.8	42	14.1	Routine
	6/21/2011	6:18	High Tide Rising	Rain	South	Moderate (10-15 mph)	82	79	306	11.7	Routine
	6/28/2011	6:15	High Tide Rising	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	2	10	12.4	Routine
	7/5/2011	6:12	Normal	Scattered Clouds	Calm	Calm (0 mph)	84	2	10	14.3	Routine
	7/12/2011	6:12	High Tide Rising	Light Rain	South	Light (0-5 mph)	85	23	42	17.4	Routine
	7/19/2011	6:27	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	80	2	10	16.9	Routine
	7/26/2011	6:29	High Tide Rising	Cloudy	West	Light (0-5 mph)	82	240	111	15.7	Routine
	8/2/2011	6:08	Low Tide Falling	Rain	South-Southwest	Light (0-5 mph)	84	23	10	19.0	Routine

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	8/9/2011	6:38	High Tide	Partly Cloudy	South	Light (0-5 mph)	82	130	111	29.9	Routine
	8/16/2011	7:33	Normal	Partly Cloudy	Northwest	Light (0-5 mph)	84	49	31	29.1	Routine
	8/23/2011	6:34	High Tide	Scattered Clouds	North	Light (0-5 mph)	87	23	10	19.5	Routine
	8/30/2011	6:32	Normal	Clear	Calm	Calm (0 mph)	84	2	10	29.0	Routine
	9/6/2011	6:28	High Tide Falling	Scattered Clouds	North	Moderate-Light (5-10 mph)	74	2	64	22.1	Routine
	9/13/2011	7:17	Normal	Clear	Calm	Calm (0 mph)	79	2	10	25.3	Routine
	9/20/2011	6:38	Low Tide Falling	Scattered Clouds	Northeast	Light (0-5 mph)	78	2	20	23.8	Routine
	9/27/2011	6:38	Normal	Scattered Clouds	West	Light (0-5 mph)	78	2	10	25.8	Routine
	10/3/2011	6:39	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	68	2	10	26.8	Routine
	10/11/2011	7:00	Low Tide	Scattered Clouds	Northeast	Light (0-5 mph)	72	2	10	24.9	Routine
	10/18/2011	7:32	High Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	76	2	20	26.3	Routine
	10/24/2011	6:58	Low Tide	Cloudy	Calm	Calm (0 mph)	69	2	10	30.1	Routine
	10/31/2011	8:18	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	62	4.5	10	28.0	Routine
Grand Isle Beach											
GIB2	***Beach Name*** *Grand Isle Beach - 2*										
	4/5/2011	8:06	Low Tide	Clear	North	Strong (20-35 mph)	62	13	10	19.0	Routine
	4/5/2011	8:06	Low Tide	Clear	North	Strong (20-35 mph)	62	20	10	19.0	Field Duplicate
	4/12/2011	6:14	Low Tide Falling	Clear	North	Moderate-Strong (15-20 mph)	67	20	20	26.4	Routine
	4/19/2011	6:17	High Tide Rising	Clear	Southeast	Moderate (10-15 mph)	74	33	10	25.1	Routine
	4/19/2011	6:17	High Tide Rising	Clear	Southeast	Moderate (10-15 mph)	74	22	10	25.1	Field Duplicate
	4/26/2011	6:10	Low Tide Falling	Cloudy	South	Moderate (10-15 mph)	76	49	10	16.3	Routine
	5/2/2011	6:23	High Tide Rising	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	76	2	20	19.1	Routine
	5/10/2011	6:21	Low Tide Falling	Clear	South	Light (0-5 mph)	77	11	10	19.4	Routine
	5/16/2011	6:53	High Tide Rising	Partly Cloudy	North	Light (0-5 mph)	72	4.5	10	33.9	Routine
	5/24/2011	6:32	Low Tide Falling	Partly Cloudy	Southeast	Light (0-5 mph)	79	1.8	10	14.5	Routine
	5/31/2011	6:42	High Tide Rising	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	81	7.8	10	14.2	Routine
	6/7/2011	6:28	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	82	2	10	16.8	Routine
	6/14/2011	6:12	Normal	Partly Cloudy	Northeast	Light (0-5 mph)	82	2	31	15.2	Routine
	6/21/2011	6:18	High Tide Rising	Rain	South	Moderate (10-15 mph)	82	130	75	10.8	Field Duplicate
	6/21/2011	6:18	High Tide Rising	Rain	South	Moderate (10-15 mph)	82	110	42	10.8	Routine
	6/28/2011	6:15	High Tide Rising	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	4	10	13.1	Routine
	7/5/2011	6:12	Normal	Scattered Clouds	Calm	Calm (0 mph)	86	2	10	14.4	Routine
	7/12/2011	6:12	High Tide Rising	Light Rain	South	Light (0-5 mph)	86	17	42	17.7	Routine

Beach / Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero-cocci	Salinity	Sample Type
	7/19/2011	6:27	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	80	13	20	17.8	Routine
	7/26/2011	6:29	High Tide Rising	Cloudy	West	Light (0-5 mph)	82	70	429	16.0	Field Duplicate
	7/26/2011	6:29	High Tide Rising	Cloudy	West	Light (0-5 mph)	82	130	288	16.1	Routine
	8/2/2011	6:08	Low Tide Falling	Rain	South-Southwest	Light (0-5 mph)	84	13	10	18.8	Routine
	8/9/2011	6:38	High Tide	Partly Cloudy	South	Light (0-5 mph)	82	130	31	29.7	Routine
	8/16/2011	7:33	Normal	Partly Cloudy	Northwest	Light (0-5 mph)	84	110	111	29.7	Routine
	8/23/2011	6:34	High Tide	Scattered Clouds	North	Light (0-5 mph)	88	33	10	17.2	Routine
	8/30/2011	6:32	Normal	Clear	Calm	Calm (0 mph)	84	2	10	29.3	Routine
	9/6/2011	6:28	High Tide Falling	Scattered Clouds	North	Moderate-Light (5-10 mph)	74	2	20	23.2	Routine
	9/13/2011	7:17	Normal	Clear	Calm	Calm (0 mph)	80	2	10	24.8	Routine
	9/20/2011	6:38	Low Tide Falling	Scattered Clouds	Northeast	Light (0-5 mph)	78	2	10	22.1	Routine
	9/27/2011	6:38	Normal	Scattered Clouds	West	Light (0-5 mph)	78	2	10	25.9	Routine
	10/3/2011	6:39	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	68	2	10	27.0	Routine
	10/11/2011	7:00	Low Tide	Scattered Clouds	Northeast	Light (0-5 mph)	72	2	10	24.8	Field Split
	10/11/2011	7:00	Low Tide	Scattered Clouds	Northeast	Light (0-5 mph)	72	2	10	24.9	Routine
	10/18/2011	7:32	High Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	76	11	64	27.1	Routine
	10/24/2011	6:58	Low Tide	Cloudy	Calm	Calm (0 mph)	69	2	10	29.5	Routine
	10/31/2011	8:18	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	62	2	10	28.1	Routine
Grand Isle Beach											
GIB3	***Beach Name*** *Grand Isle Beach - 3*										
	4/5/2011	8:06	Low Tide	Clear	North	Strong (20-35 mph)	62	23	42	19.3	Routine
	4/12/2011	6:14	Low Tide Falling	Clear	North	Moderate-Strong (15-20 mph)	68	20	10	25.5	Routine
	4/19/2011	6:17	High Tide Rising	Clear	Southeast	Moderate (10-15 mph)	74	26	10	25.1	Routine
	4/26/2011	6:10	Low Tide Falling	Cloudy	South	Moderate (10-15 mph)	76	33	10	16.5	Routine
	5/2/2011	6:23	High Tide Rising	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	76	170	10	19.4	Routine
	5/10/2011	6:21	Low Tide Falling	Clear	South	Light (0-5 mph)	78	7.8	10	19.3	Routine
	5/10/2011	6:21	Low Tide Falling	Clear	South	Light (0-5 mph)	78	7.8	10	19.4	Field Duplicate
	5/16/2011	6:53	High Tide Rising	Partly Cloudy	North	Light (0-5 mph)	72	2	10	31.7	Routine
	5/16/2011	6:53	High Tide Rising	Partly Cloudy	North	Light (0-5 mph)	72	2	1013	31.6	Field Duplicate
	5/24/2011	6:32	Low Tide Falling	Partly Cloudy	Southeast	Light (0-5 mph)	79	2	10	13.9	Routine
	5/31/2011	6:42	High Tide Rising	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	81	23	20	15.1	Routine
	6/7/2011	6:28	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	82	2	10	17.3	Routine
	6/14/2011	6:12	Normal	Partly Cloudy	Northeast	Light (0-5 mph)	82	2	10	16.7	Routine

Beach / Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero-cocci	Salinity	Sample Type
	6/21/2011	6:18	High Tide Rising	Rain	South	Moderate (10-15 mph)	82	23	111	9.7	Routine
	6/28/2011	6:15	High Tide Rising	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	4.5	53	13.1	Routine
	6/28/2011	6:15	High Tide Rising	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	11	20	13.1	Field Duplicate
	7/5/2011	6:12	Normal	Scattered Clouds	Calm	Calm (0 mph)	86	7.8	10	15.3	Routine
	7/12/2011	6:12	High Tide Rising	Light Rain	South	Light (0-5 mph)	86	33	885	17.4	Routine
	7/19/2011	6:27	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	80	2	10	16.1	Routine
	7/19/2011	6:27	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	80	7.8	10	16.0	Field Duplicate
	7/26/2011	6:29	High Tide Rising	Cloudy	West	Light (0-5 mph)	82	49	192	15.3	Routine
	8/2/2011	6:08	Low Tide Falling	Rain	South-Southwest	Light (0-5 mph)	84	79	31	18.5	Routine
	8/2/2011	6:08	Low Tide Falling	Rain	South-Southwest	Light (0-5 mph)	84	350	53	19.4	Field Split
	8/9/2011	6:38	High Tide	Partly Cloudy	South	Light (0-5 mph)	82	23	20	30.5	Routine
	8/16/2011	7:33	Normal	Partly Cloudy	Northwest	Light (0-5 mph)	84	49	10	30.4	Routine
	8/23/2011	6:34	High Tide	Scattered Clouds	North	Light (0-5 mph)	89	4.5	10	16.9	Routine
	8/23/2011	6:34	High Tide	Scattered Clouds	North	Light (0-5 mph)	89	4.5	10	17.0	Field Split
	8/30/2011	6:32	Normal	Clear	Calm	Calm (0 mph)	84	2	10	29.5	Routine
	9/6/2011	6:28	High Tide Falling	Scattered Clouds	North	Moderate-Light (5-10 mph)	74	2	20	24.4	Routine
	9/13/2011	7:17	Normal	Clear	Calm	Calm (0 mph)	80	4.5	10	26.5	Routine
	9/20/2011	6:38	Low Tide Falling	Scattered Clouds	Northeast	Light (0-5 mph)	78	2	20	22.7	Routine
	9/27/2011	6:38	Normal	Scattered Clouds	West	Light (0-5 mph)	78	4.5	20	28.4	Routine
	10/3/2011	6:39	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	68	2	10	26.5	Routine
	10/11/2011	7:00	Low Tide	Scattered Clouds	Northeast	Light (0-5 mph)	72	2	10	24.6	Routine
	10/18/2011	7:32	High Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	76	2	10	27.0	Routine
	10/24/2011	6:58	Low Tide	Cloudy	Calm	Calm (0 mph)	69	2	10	30.3	Routine
	10/31/2011	8:18	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	62	2	10	28.3	Routine
	10/31/2011	8:18	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	62	2	10	28.0	Field Duplicate
Grand Isle State Park											
GISP1	***Beach Name*** *Grand Isle State Park - 1*										
	4/5/2011	8:06	Low Tide	Clear	North	Strong (20-35 mph)	60	13	10	11.8	Routine
	4/12/2011	6:14	Low Tide Falling	Clear	North	Moderate-Strong (15-20 mph)	65	4.5	10	11.3	Routine
	4/19/2011	6:17	High Tide Rising	Clear	Southeast	Moderate (10-15 mph)	74	26	10	23.4	Routine
	4/26/2011	6:10	Low Tide Falling	Cloudy	South	Moderate (10-15 mph)	75	2	10	16.1	Routine
	5/2/2011	6:23	High Tide Rising	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	76	6.1	10	16.9	Routine
	5/2/2011	6:23	High Tide Rising	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	76	11	75	16.8	Field Split

Beach / Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero-cocci	Salinity	Sample Type
	5/10/2011	6:21	Low Tide Falling	Clear	South	Light (0-5 mph)	75	4.5	10	17.4	Field Split
	5/10/2011	6:21	Low Tide Falling	Clear	South	Light (0-5 mph)	75	2	42	17.6	Routine
	5/16/2011	6:53	High Tide Rising	Partly Cloudy	North	Light (0-5 mph)	70	4.5	10	33.1	Routine
	5/24/2011	6:32	Low Tide Falling	Partly Cloudy	Southeast	Light (0-5 mph)	79	2	10	11.9	Routine
	5/31/2011	6:42	High Tide Rising	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	81	23	20	15.4	Routine
	6/7/2011	6:28	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	80	2	10	15.5	Routine
	6/14/2011	6:12	Normal	Partly Cloudy	Northeast	Light (0-5 mph)	80	49	20	11.7	Routine
	6/21/2011	6:18	High Tide Rising	Rain	South	Moderate (10-15 mph)	81	2	87	13.1	Routine
	6/28/2011	6:15	High Tide Rising	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	170	31	11.4	Routine
	7/5/2011	6:12	Normal	Scattered Clouds	Calm	Calm (0 mph)	82	540	20	14.0	Routine
	7/12/2011	6:12	High Tide Rising	Light Rain	South	Light (0-5 mph)	84	130	288	16.9	Routine
	7/19/2011	6:27	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	78	33	31	13.8	Routine
	7/26/2011	6:29	High Tide Rising	Cloudy	West	Light (0-5 mph)	80	540	99	17.3	Routine
	8/2/2011	6:08	Low Tide Falling	Rain	South-Southwest	Light (0-5 mph)	83	130	20	17.4	Routine
	8/9/2011	6:38	High Tide	Partly Cloudy	South	Light (0-5 mph)	81	130	238	29.5	Routine
	8/16/2011	7:33	Normal	Partly Cloudy	Northwest	Light (0-5 mph)	82	13	20	29.1	Routine
	8/23/2011	6:34	High Tide	Scattered Clouds	North	Light (0-5 mph)	85	170	124	16.7	Routine
	8/30/2011	6:32	Normal	Clear	Calm	Calm (0 mph)	84	2	10	26.7	Routine
	9/6/2011	6:28	High Tide Falling	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	23	10	18.4	Field Duplicate
	9/6/2011	6:28	High Tide Falling	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	7.8	31	18.4	Routine
	9/13/2011	7:17	Normal	Clear	Calm	Calm (0 mph)	76	17	31	20.8	Routine
	9/20/2011	6:38	Low Tide Falling	Scattered Clouds	Northeast	Light (0-5 mph)	77	11	10	21.8	Routine
	9/27/2011	6:38	Normal	Scattered Clouds	West	Light (0-5 mph)	76	7.8	31	22.3	Routine
	10/3/2011	6:39	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	65	6.8	10	24.7	Routine
	10/11/2011	7:00	Low Tide	Scattered Clouds	Northeast	Light (0-5 mph)	72	2	10	24.7	Routine
	10/18/2011	7:32	High Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	76	4.5	10	26.6	Field Duplicate
	10/18/2011	7:32	High Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	76	6.8	10	26.2	Routine
	10/24/2011	6:58	Low Tide	Cloudy	Calm	Calm (0 mph)	65	22	10	30.0	Routine
	10/31/2011	8:18	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	60	2	10	29.3	Routine
Grand Isle State Park											
GISP2			***Beach Name*** *Grand Isle State Park - 2*								
	4/5/2011	8:06	Low Tide	Clear	North	Strong (20-35 mph)	60	49	10	12.2	Routine
	4/12/2011	6:14	Low Tide Falling	Clear	North	Moderate-Strong (15-20 mph)	65	2	10	15.5	Routine

Beach
Station ID

Date	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
4/12/2011	6:14	Low Tide Falling	Clear	North	Moderate-Strong (15-20 mph)	65	7.5	10	15.6	Field Split
4/19/2011	6:17	High Tide Rising	Clear	Southeast	Moderate (10-15 mph)	74	920	53	23.4	Routine
4/26/2011	6:10	Low Tide Falling	Cloudy	South	Moderate (10-15 mph)	75	4.5	10	16.1	Routine
5/2/2011	6:23	High Tide Rising	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	76	7.8	20	16.8	Routine
5/10/2011	6:21	Low Tide Falling	Clear	South	Light (0-5 mph)	75	11	10	17.2	Routine
5/16/2011	6:53	High Tide Rising	Partly Cloudy	North	Light (0-5 mph)	70	7.8	20	33.9	Routine
5/24/2011	6:32	Low Tide Falling	Partly Cloudy	Southeast	Light (0-5 mph)	79	13	10	12.4	Routine
5/31/2011	6:42	High Tide Rising	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	81	23	20	14.2	Routine
6/7/2011	6:28	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	80	2	10	15.5	Routine
6/7/2011	6:28	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	80	2	10	15.4	Field Duplicate
6/14/2011	6:12	Normal	Partly Cloudy	Northeast	Light (0-5 mph)	80	33	10	11.8	Routine
6/21/2011	6:18	High Tide Rising	Rain	South	Moderate (10-15 mph)	81	13	53	13.3	Routine
6/28/2011	6:15	High Tide Rising	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	130	111	11.9	Routine
7/5/2011	6:12	Normal	Scattered Clouds	Calm	Calm (0 mph)	82	220	10	13.9	Routine
7/12/2011	6:12	High Tide Rising	Light Rain	South	Light (0-5 mph)	84	350	560	16.9	Routine
7/19/2011	6:27	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	78	2	10	10.9	Routine
7/26/2011	6:29	High Tide Rising	Cloudy	West	Light (0-5 mph)	80	540	42	17.1	Routine
8/2/2011	6:08	Low Tide Falling	Rain	South-Southwest	Light (0-5 mph)	83	170	20	17.8	Routine
8/9/2011	6:38	High Tide	Partly Cloudy	South	Light (0-5 mph)	81	170	31	29.2	Routine
8/16/2011	7:33	Normal	Partly Cloudy	Northwest	Light (0-5 mph)	82	17	10	29.5	Routine
8/23/2011	6:34	High Tide	Scattered Clouds	North	Light (0-5 mph)	85	130	10	19.5	Field Split
8/23/2011	6:34	High Tide	Scattered Clouds	North	Light (0-5 mph)	85	79	42	19.4	Routine
8/30/2011	6:32	Normal	Clear	Calm	Calm (0 mph)	84	33	531	26.8	Routine
9/6/2011	6:28	High Tide Falling	Scattered Clouds	North	Moderate-Light (5-10 mph)	71	7.8	31	18.6	Routine
9/13/2011	7:17	Normal	Clear	Calm	Calm (0 mph)	76	4.5	10	21.8	Routine
9/20/2011	6:38	Low Tide Falling	Scattered Clouds	Northeast	Light (0-5 mph)	77	7.8	20	21.5	Routine
9/27/2011	6:38	Normal	Scattered Clouds	West	Light (0-5 mph)	76	2	31	23.0	Routine
10/3/2011	6:39	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	65	11	10	25.0	Routine
10/11/2011	7:00	Low Tide	Scattered Clouds	Northeast	Light (0-5 mph)	72	2	10	24.9	Routine
10/18/2011	7:32	High Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	76	4.5	10	26.5	Routine
10/24/2011	6:58	Low Tide	Cloudy	Calm	Calm (0 mph)	66	17	53	28.9	Routine
10/31/2011	8:18	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	60	2	10	29.7	Routine

Grand Isle State Park

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
GISP3	***Beach Name*** *Grand Isle State Park - 3*										
	4/5/2011	8:06	Low Tide	Clear	North	Strong (20-35 mph)	60	33	10	12.2	Routine
	4/12/2011	6:14	Low Tide Falling	Clear	North	Moderate-Strong (15-20 mph)	65	7.8	10	16.1	Routine
	4/19/2011	6:17	High Tide Rising	Clear	Southeast	Moderate (10-15 mph)	74	79	945	23.2	Routine
	4/26/2011	6:10	Low Tide Falling	Cloudy	South	Moderate (10-15 mph)	75	4.5	10	16.0	Routine
	5/2/2011	6:23	High Tide Rising	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	76	23	10	16.9	Routine
	5/10/2011	6:21	Low Tide Falling	Clear	South	Light (0-5 mph)	75	4.5	10	17.3	Routine
	5/16/2011	6:53	High Tide Rising	Partly Cloudy	North	Light (0-5 mph)	70	4	67	34.0	Routine
	5/24/2011	6:32	Low Tide Falling	Partly Cloudy	Southeast	Light (0-5 mph)	79	79	10	12.5	Routine
	5/31/2011	6:42	High Tide Rising	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	81	2	31	15.1	Routine
	6/7/2011	6:28	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	80	2	10	15.4	Routine
	6/14/2011	6:12	Normal	Partly Cloudy	Northeast	Light (0-5 mph)	81	33	10	11.9	Routine
	6/21/2011	6:18	High Tide Rising	Rain	South	Moderate (10-15 mph)	81	4.5	64	13.4	Field Split
	6/21/2011	6:18	High Tide Rising	Rain	South	Moderate (10-15 mph)	81	17	64	13.4	Routine
	6/28/2011	6:15	High Tide Rising	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	130	150	11.8	Routine
	6/28/2011	6:15	High Tide Rising	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	79	124	11.8	Field Duplicate
	7/5/2011	6:12	Normal	Scattered Clouds	Calm	Calm (0 mph)	82	70	20	14.0	Routine
	7/12/2011	6:12	High Tide Rising	Light Rain	South	Light (0-5 mph)	84	49	453	16.9	Routine
	7/19/2011	6:27	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	79	2	10	11.1	Routine
	7/26/2011	6:29	High Tide Rising	Cloudy	West	Light (0-5 mph)	80	540	111	17.0	Routine
	8/2/2011	6:08	Low Tide Falling	Rain	South-Southwest	Light (0-5 mph)	83	79	10	18.7	Routine
	8/9/2011	6:38	High Tide	Partly Cloudy	South	Light (0-5 mph)	81	350	42	29.5	Routine
	8/16/2011	7:33	Normal	Partly Cloudy	Northwest	Light (0-5 mph)	82	7.8	10	29.5	Routine
	8/23/2011	6:34	High Tide	Scattered Clouds	North	Light (0-5 mph)	86	70	2005	18.0	Routine
	8/30/2011	6:32	Normal	Clear	Calm	Calm (0 mph)	84	2	10	27.3	Routine
	9/6/2011	6:28	High Tide Falling	Scattered Clouds	North	Moderate-Light (5-10 mph)	72	7.8	75	18.5	Routine
	9/13/2011	7:17	Normal	Clear	Calm	Calm (0 mph)	76	7.8	10	22.1	Routine
	9/20/2011	6:38	Low Tide Falling	Scattered Clouds	Northeast	Light (0-5 mph)	77	11	31	21.7	Routine
	9/27/2011	6:38	Normal	Scattered Clouds	West	Light (0-5 mph)	76	2	10	24.0	Routine
	10/3/2011	6:39	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	65	45	10	24.6	Routine
	10/11/2011	7:00	Low Tide	Scattered Clouds	Northeast	Light (0-5 mph)	72	4.5	10	24.7	Routine
	10/18/2011	7:32	High Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	76	2	10	26.6	Routine
	10/24/2011	6:58	Low Tide	Cloudy	Calm	Calm (0 mph)	67	49	20	29.6	Routine
	10/31/2011	8:18	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	60	2	10	29.2	Field Split

Beach / *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	10/31/2011	8:18	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	60	2	10	29.2	Routine
Grand Isle State Park											
GISP4	***Beach Name*** *Grand Isle State Park - 4*										
	4/5/2011	8:06	Low Tide	Clear	North	Strong (20-35 mph)	60	17	10	12.0	Field Duplicate
	4/5/2011	8:06	Low Tide	Clear	North	Strong (20-35 mph)	60	13	10	12.1	Routine
	4/12/2011	6:14	Low Tide Falling	Clear	North	Moderate-Strong (15-20 mph)	65	17	10	16.2	Field Duplicate
	4/12/2011	6:14	Low Tide Falling	Clear	North	Moderate-Strong (15-20 mph)	65	7.5	20	16.2	Routine
	4/19/2011	6:17	High Tide Rising	Clear	Southeast	Moderate (10-15 mph)	74	46	364	23.2	Routine
	4/26/2011	6:10	Low Tide Falling	Cloudy	South	Moderate (10-15 mph)	75	2	10	16.0	Routine
	5/2/2011	6:23	High Tide Rising	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	76	33	10	16.9	Routine
	5/10/2011	6:21	Low Tide Falling	Clear	South	Light (0-5 mph)	75	4.5	10	17.0	Routine
	5/16/2011	6:53	High Tide Rising	Partly Cloudy	North	Light (0-5 mph)	70	130	10	34.1	Routine
	5/24/2011	6:32	Low Tide Falling	Partly Cloudy	Southeast	Light (0-5 mph)	79	110	10	12.0	Routine
	5/31/2011	6:42	High Tide Rising	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	81	7.8	87	16.3	Routine
	6/7/2011	6:28	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	80	17	10	15.5	Field Split
	6/7/2011	6:28	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	80	23	10	15.8	Routine
	6/14/2011	6:12	Normal	Partly Cloudy	Northeast	Light (0-5 mph)	82	13	10	12.0	Routine
	6/21/2011	6:18	High Tide Rising	Rain	South	Moderate (10-15 mph)	81	13	87	13.2	Routine
	6/28/2011	6:15	High Tide Rising	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	240	42	11.8	Field Duplicate
	6/28/2011	6:15	High Tide Rising	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	170	31	11.8	Routine
	7/5/2011	6:12	Normal	Scattered Clouds	Calm	Calm (0 mph)	82	79	20	14.0	Routine
	7/12/2011	6:12	High Tide Rising	Light Rain	South	Light (0-5 mph)	84	95	75	16.8	Routine
	7/19/2011	6:27	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	80	6.8	10	11.7	Routine
	7/26/2011	6:29	High Tide Rising	Cloudy	West	Light (0-5 mph)	81	350	75	17.1	Routine
	8/2/2011	6:08	Low Tide Falling	Rain	South-Southwest	Light (0-5 mph)	83	130	10	18.5	Routine
	8/9/2011	6:38	High Tide	Partly Cloudy	South	Light (0-5 mph)	81	130	10	29.6	Routine
	8/16/2011	7:33	Normal	Partly Cloudy	Northwest	Light (0-5 mph)	82	46	10	29.6	Routine
	8/23/2011	6:34	High Tide	Scattered Clouds	North	Light (0-5 mph)	86	23	10	20.1	Routine
	8/30/2011	6:32	Normal	Clear	Calm	Calm (0 mph)	84	7.8	10	27.2	Routine
	9/6/2011	6:28	High Tide Falling	Scattered Clouds	North	Moderate-Light (5-10 mph)	74	540	20	18.2	Routine
	9/13/2011	7:17	Normal	Clear	Calm	Calm (0 mph)	77	2	10	22.7	Routine
	9/20/2011	6:38	Low Tide Falling	Scattered Clouds	Northeast	Light (0-5 mph)	77	2	10	21.7	Routine
	9/27/2011	6:38	Normal	Scattered Clouds	West	Light (0-5 mph)	76	4.5	10	23.4	Routine

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	10/3/2011	6:39	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	65	7.8	10	24.8	Routine
	10/11/2011	7:00	Low Tide	Scattered Clouds	Northeast	Light (0-5 mph)	72	2	10	24.8	Routine
	10/18/2011	7:32	High Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	76	2	10	26.5	Routine
	10/24/2011	6:58	Low Tide	Cloudy	Calm	Calm (0 mph)	68	6.8	20	29.8	Routine
	10/31/2011	8:18	Low Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	61	4.5	10	29.0	Routine
Gulf Breeze											
GBRZ1			***Beach Name*** *Gulf Breeze*								
	4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	170	2005	21.5	Routine
	4/11/2011	7:46	Normal	Cloudy	Southwest	Moderate (10-15 mph)	72	2	20	15.5	Routine
	4/18/2011	7:45	High Tide Falling	Partly Cloudy	Southeast	Moderate (10-15 mph)	74	4.5	1652	28.4	Routine
	4/25/2011	7:45	Normal	Partly Cloudy	South	Strong (20-35 mph)	76	2	124	14.2	Routine
	5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	2005	29.8	Routine
	5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	11	222	22.5	Routine
	5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	76	2	137	29.6	Routine
	5/23/2011	8:00	High Tide Falling	Scattered Clouds	South	Moderate (10-15 mph)	76	2	53	22.2	Routine
	5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	17	1445	17.4	Routine
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	7.8	945	15.6	Routine
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	2	885	15.5	Field Duplicate
	6/13/2011	8:15	Normal	Scattered Clouds	West	Light (0-5 mph)	82	2	10	14.3	Routine
	6/20/2011	7:30	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	82	7.8	254	32.5	Routine
	6/27/2011	8:00	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	82	2	324	13.2	Routine
	7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	6.8	945	27.4	Routine
	7/11/2011	7:30	Normal	Scattered Clouds	South	Light (0-5 mph)	86	2	344	30.2	Routine
	7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	7.8	53	35.0	Field Duplicate
	7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	7.8	20	35.0	Routine
	7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	2	738	35.0	Routine
	8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	23	31	26.0	Routine
	8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	2	87	35.0	Field Duplicate
	8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	2	99	35.0	Routine
	8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	4.5	31	35.0	Routine
	8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	2	42	35.0	Routine
	8/29/2011	8:00	Low Tide Falling	Clear	East	Light (0-5 mph)	88	4	10	23.5	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	4.5	64	32.2	Routine

Beach / Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero-cocci	Salinity	Sample Type
	9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	2	111	31.8	Routine
	9/19/2011	8:00	Normal	Light Rain	East-Southeast	Light (0-5 mph)	80	13	150	32.2	Routine
	9/26/2011	7:40	Low Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	80	7.8	75	32.1	Routine
	10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	42	34.1	Routine
	10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	31	34.8	Field Split
	10/10/2011	8:30	Normal	Cloudy	East-Northeast	Moderate (10-15 mph)	76	2	111	21.5	Routine
	10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	2	31	28.6	Routine
	10/24/2011	8:00	Low Tide Falling	Scattered Clouds	North	Light (0-5 mph)	75	6.8	20	30.4	Field Split
	10/24/2011	8:00	Low Tide Falling	Scattered Clouds	North	Light (0-5 mph)	75	1.8	10	31.1	Routine
	10/31/2011	8:30	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	66	2	10	30.7	Routine
Holly Beach											
HOLLY1	***Beach Name*** *Holly Beach - 1*										
	4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	11	591	23.2	Routine
	4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	2	560	23.4	Field Split
	4/11/2011	7:46	Normal	Cloudy	Southwest	Moderate (10-15 mph)	72	2	42	13.4	Routine
	4/18/2011	7:45	High Tide Falling	Partly Cloudy	Southeast	Moderate (10-15 mph)	74	4.5	2005	32.6	Routine
	4/25/2011	7:45	Normal	Partly Cloudy	South	Strong (20-35 mph)	76	23	31	12.9	Routine
	5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	945	29.8	Routine
	5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	6.8	20	20.1	Routine
	5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	4	10	20.0	Field Duplicate
	5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	74	1.8	137	29.4	Routine
	5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	74	1.8	137	29.4	Field Duplicate
	5/23/2011	9:00	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	76	2	31	18.3	Routine
	5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	2	429	17.7	Routine
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	22	10	15.2	Routine
	6/13/2011	8:15	Normal	Scattered Clouds	West	Light (0-5 mph)	82	4.5	10	14.0	Routine
	6/20/2011	7:30	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	82	33	178	27.0	Routine
	6/27/2011	8:00	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	82	13	31	10.1	Routine
	7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	13	254	24.5	Routine
	7/11/2011	7:30	Normal	Scattered Clouds	South	Light (0-5 mph)	86	2	64	29.9	Routine
	7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	13	178	35.0	Routine
	7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	4	53	35.0	Routine
	8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	13	10	24.9	Routine

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	4	222	35.0	Routine
	8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	2	20	35.0	Routine
	8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	2	10	35.0	Routine
	8/29/2011	8:00	Low Tide Falling	Clear	East	Light (0-5 mph)	88	4	10	23.0	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	13	64	33.0	Routine
	9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	2	10	31.9	Field Split
	9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	2	10	31.8	Routine
	9/19/2011	8:00	Normal	Light Rain	East-Southeast	Light (0-5 mph)	80	2	10	31.9	Routine
	9/26/2011	7:40	Low Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	80	13	87	32.1	Routine
	10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	10	34.2	Routine
	10/10/2011	8:30	Normal	Cloudy	East-Northeast	Moderate (10-15 mph)	76	2	53	19.7	Routine
	10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	2	10	29.2	Routine
	10/24/2011	8:00	Low Tide Falling	Scattered Clouds	North	Light (0-5 mph)	75	2	53	30.4	Routine
	10/31/2011	8:30	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	66	2	10	30.4	Routine
Holly Beach											
HOLLY2	***Beach Name*** *Holly Beach - 2*										
	4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	6.8	697	23.4	Routine
	4/11/2011	7:46	Normal	Cloudy	Southwest	Moderate (10-15 mph)	72	2	99	13.5	Routine
	4/18/2011	7:45	High Tide Falling	Partly Cloudy	Southeast	Moderate (10-15 mph)	74	2	2005	32.3	Routine
	4/25/2011	7:45	Normal	Partly Cloudy	South	Strong (20-35 mph)	76	11	99	12.9	Routine
	5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	2005	24.3	Routine
	5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	2	20	20.2	Routine
	5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	74	2	384	29.7	Routine
	5/23/2011	9:00	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	76	2	20	19.0	Routine
	5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	2	344	18.0	Routine
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	23	111	15.4	Field Split
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	79	150	15.1	Routine
	6/13/2011	8:15	Normal	Scattered Clouds	West	Light (0-5 mph)	82	23	75	14.6	Routine
	6/20/2011	7:30	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	82	6.8	111	26.7	Routine
	6/27/2011	8:00	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	82	70	478	10.1	Routine
	7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	33	222	24.5	Routine
	7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	13	254	24.6	Field Split
	7/11/2011	7:30	Normal	Scattered Clouds	South	Light (0-5 mph)	86	4	164	30.2	Routine

Beach / Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero-cocci	Salinity	Sample Type
	7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	33	222	35.0	Routine
	7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	2	137	35.0	Field Duplicate
	7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	4	99	35.0	Routine
	8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	7.8	10	24.9	Routine
	8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	2	111	35.0	Routine
	8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	2	10	35.0	Routine
	8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	2	10	35.0	Routine
	8/29/2011	8:00	Low Tide Falling	Clear	East	Light (0-5 mph)	88	2	10	23.0	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	33	99	33.3	Routine
	9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	2	31	32.1	Routine
	9/19/2011	8:00	Normal	Light Rain	East-Southeast	Light (0-5 mph)	80	2	10	32.8	Routine
	9/26/2011	7:40	Low Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	80	23	137	32.5	Routine
	10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	31	34.5	Routine
	10/10/2011	8:30	Normal	Cloudy	East-Northeast	Moderate (10-15 mph)	76	2	42	19.3	Routine
	10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	2	42	29.2	Routine
	10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	2	31	29.0	Field Split
	10/24/2011	8:00	Low Tide Falling	Scattered Clouds	North	Light (0-5 mph)	75	4.5	75	30.4	Routine
	10/31/2011	8:30	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	66	2	10	30.9	Routine
Holly Beach											
HOLLY3	***Beach Name*** *Holly Beach - 3*										
	4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	4.5	531	23.1	Routine
	4/11/2011	7:46	Normal	Cloudy	Southwest	Moderate (10-15 mph)	72	2	99	18.3	Routine
	4/18/2011	7:45	High Tide Falling	Partly Cloudy	Southeast	Moderate (10-15 mph)	74	4.5	1652	32.6	Routine
	4/25/2011	7:45	Normal	Partly Cloudy	South	Strong (20-35 mph)	76	2	87	12.9	Routine
	5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	1652	23.5	Routine
	5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	17	42	20.0	Routine
	5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	74	2	364	30.0	Routine
	5/23/2011	9:00	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	76	2	42	18.7	Routine
	5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	11	384	17.9	Routine
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	130	344	15.4	Routine
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	170	364	14.9	Field Duplicate
	6/13/2011	8:15	Normal	Scattered Clouds	West	Light (0-5 mph)	82	4.5	124	14.5	Routine
	6/20/2011	7:30	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	82	920	659	27.1	Routine

Beach / Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero-cocci	Salinity	Sample Type
	6/27/2011	8:00	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	82	33	945	10.2	Routine
	7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	170	429	24.3	Routine
	7/11/2011	7:30	Normal	Scattered Clouds	South	Light (0-5 mph)	86	4.5	697	29.4	Routine
	7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	79	453	35.0	Routine
	7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	4.5	64	35.0	Routine
	8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	4.5	31	24.8	Routine
	8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	2	150	35.0	Routine
	8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	4	42	35.0	Field Duplicate
	8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	1.8	53	35.0	Routine
	8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	2	10	35.0	Routine
	8/29/2011	8:00	Low Tide Falling	Clear	East	Light (0-5 mph)	88	2	10	21.9	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	23	164	33.3	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	17	111	32.9	Field Duplicate
	9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	2	10	31.7	Routine
	9/19/2011	8:00	Normal	Light Rain	East-Southeast	Light (0-5 mph)	80	33	20	31.3	Routine
	9/26/2011	7:40	Low Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	80	2	87	32.3	Routine
	10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	10	34.9	Routine
	10/10/2011	8:30	Normal	Cloudy	East-Northeast	Moderate (10-15 mph)	76	2	64	19.4	Routine
	10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	7.8	42	29.4	Routine
	10/24/2011	8:00	Low Tide Falling	Scattered Clouds	North	Light (0-5 mph)	75	2	31	30.5	Routine
	10/31/2011	8:30	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	66	2	10	30.3	Routine
Holly Beach											
HOLLY4	***Beach Name*** *Holly Beach - 4*										
	4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	23	2005	22.8	Routine
	4/11/2011	7:46	Normal	Cloudy	Southwest	Moderate (10-15 mph)	72	2	87	31.0	Routine
	4/18/2011	7:45	High Tide Falling	Partly Cloudy	Southeast	Moderate (10-15 mph)	74	2	1298	31.3	Routine
	4/25/2011	7:45	Normal	Partly Cloudy	South	Strong (20-35 mph)	76	2	31	12.8	Routine
	5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	1652	30.6	Routine
	5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	2	20	19.7	Routine
	5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	74	4.5	306	30.0	Routine
	5/23/2011	8:00	High Tide Falling	Scattered Clouds	South	Moderate (10-15 mph)	76	4.5	42	18.9	Routine
	5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	2	560	17.7	Routine
	5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	2	344	17.7	Field Split

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	33	137	15.3	Routine
	6/13/2011	8:15	Normal	Scattered Clouds	West	Light (0-5 mph)	82	4.5	42	14.5	Routine
	6/20/2011	7:30	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	82	23	831	27.6	Routine
	6/27/2011	8:00	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	82	33	429	10.1	Routine
	7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	350	531	24.3	Routine
	7/11/2011	7:30	Normal	Scattered Clouds	South	Light (0-5 mph)	86	33	344	29.9	Routine
	7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	49	178	35.0	Routine
	7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	4.5	150	35.0	Routine
	8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	7.8	53	25.1	Routine
	8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	13	222	35.0	Routine
	8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	7.8	31	35.0	Routine
	8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	2	10	35.0	Routine
	8/29/2011	8:00	Low Tide Falling	Clear	East	Light (0-5 mph)	88	2	10	22.2	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	49	111	30.5	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	33	87	32.7	Field Split
	9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	1.8	53	32.1	Routine
	9/19/2011	8:00	Normal	Light Rain	East-Southeast	Light (0-5 mph)	80	33	10	32.5	Routine
	9/26/2011	7:40	Low Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	80	4.5	99	32.2	Routine
	10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	10	34.8	Routine
	10/10/2011	8:30	Normal	Cloudy	East-Northeast	Moderate (10-15 mph)	76	2	20	19.5	Routine
	10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	7.8	10	29.3	Routine
	10/24/2011	8:00	Low Tide Falling	Scattered Clouds	North	Light (0-5 mph)	75	2	111	30.7	Routine
	10/31/2011	8:30	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	66	2	10	30.6	Routine
Holly Beach											
HOLLY5	***Beach Name*** *Holly Beach - 5*										
	4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	13	1091	23.0	Routine
	4/11/2011	7:46	Normal	Cloudy	Southwest	Moderate (10-15 mph)	72	4.5	87	13.4	Routine
	4/18/2011	7:45	High Tide Falling	Partly Cloudy	Southeast	Moderate (10-15 mph)	74	4.5	1445	32.5	Routine
	4/25/2011	7:45	Normal	Partly Cloudy	South	Strong (20-35 mph)	76	14	99	12.7	Routine
	5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	2005	30.4	Routine
	5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	2005	30.7	Field Split
	5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	33	31	20.3	Routine
	5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	74	4.5	364	29.8	Routine

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	5/23/2011	8:00	High Tide Falling	Scattered Clouds	South	Moderate (10-15 mph)	76	17	99	19.1	Routine
	5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	2	344	17.5	Routine
	5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	2	271	17.7	Field Split
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	33	31	14.7	Routine
	6/13/2011	8:15	Normal	Scattered Clouds	West	Light (0-5 mph)	82	4	164	14.2	Routine
	6/20/2011	7:30	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	82	33	1184	28.4	Routine
	6/27/2011	8:00	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	82	49	31	10.1	Routine
	7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	33	288	24.5	Routine
	7/11/2011	7:30	Normal	Scattered Clouds	South	Light (0-5 mph)	86	23	531	29.7	Routine
	7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	33	288	35.0	Routine
	7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	2	178	35.0	Routine
	8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	21	75	24.6	Routine
	8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	2	222	35.0	Routine
	8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	2	64	35.0	Routine
	8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	2	10	35.0	Routine
	8/29/2011	8:00	Low Tide Falling	Clear	East	Light (0-5 mph)	88	4.5	20	22.4	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	1.8	10	33.3	Routine
	9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	4.5	31	32.0	Field Split
	9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	2	75	32.0	Routine
	9/19/2011	8:00	Normal	Light Rain	East-Southeast	Light (0-5 mph)	80	4.5	31	32.3	Routine
	9/26/2011	7:40	Low Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	80	4.5	222	32.2	Routine
	10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	10	35.0	Routine
	10/10/2011	8:30	Normal	Cloudy	East-Northeast	Moderate (10-15 mph)	76	2	10	19.6	Routine
	10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	2	20	28.9	Routine
	10/24/2011	8:00	Low Tide Falling	Scattered Clouds	North	Light (0-5 mph)	75	4.5	87	30.4	Routine
	10/31/2011	8:30	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	66	2	10	30.3	Routine
Holly Beach											
HOLLY6	***Beach Name*** *Holly Beach - 6*										
	4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	33	1091	22.4	Routine
	4/11/2011	7:46	Normal	Cloudy	Southwest	Moderate (10-15 mph)	72	4.5	64	13.3	Routine
	4/18/2011	7:45	High Tide Falling	Partly Cloudy	Southeast	Moderate (10-15 mph)	74	2	1298	32.6	Routine
	4/25/2011	7:45	Normal	Partly Cloudy	South	Strong (20-35 mph)	76	22	75	13.9	Routine
	5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	2005	30.4	Field Duplicate

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	4	2005	26.6	Routine
	5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	240	429	20.5	Routine
	5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	74	2	429	29.7	Routine
	5/23/2011	8:00	High Tide Falling	Scattered Clouds	South	Moderate (10-15 mph)	76	7.8	75	19.3	Routine
	5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	6.8	453	17.7	Routine
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	70	207	15.4	Routine
	6/13/2011	8:15	Normal	Scattered Clouds	West	Light (0-5 mph)	82	7.8	384	14.1	Routine
	6/20/2011	7:30	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	82	46	1013	29.1	Routine
	6/27/2011	8:00	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	82	95	238	10.4	Routine
	7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	33	384	24.6	Routine
	7/11/2011	7:30	Normal	Scattered Clouds	South	Light (0-5 mph)	86	17	1091	29.9	Routine
	7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	110	453	35.0	Routine
	7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	2	178	35.0	Routine
	8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	17	87	24.9	Routine
	8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	22	111	25.1	Field Duplicate
	8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	2	288	35.0	Routine
	8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	1.8	31	35.0	Routine
	8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	1.8	10	35.0	Routine
	8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	2	20	35.0	Field Split
	8/29/2011	8:00	Low Tide Falling	Clear	East	Light (0-5 mph)	88	2	10	22.8	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	7.8	31	33.1	Routine
	9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	4.5	99	32.2	Routine
	9/19/2011	8:00	Normal	Light Rain	East-Southeast	Light (0-5 mph)	80	13	20	32.4	Routine
	9/26/2011	7:40	Low Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	80	6.8	124	32.2	Routine
	10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	10	34.9	Routine
	10/10/2011	8:30	Normal	Cloudy	East-Northeast	Moderate (10-15 mph)	76	2	10	19.1	Routine
	10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	2	10	29.2	Routine
	10/24/2011	8:00	Low Tide Falling	Scattered Clouds	North	Light (0-5 mph)	75	6.8	53	30.4	Routine
	10/31/2011	8:30	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	66	1.8	10	30.4	Routine
Little Florida											
LTFL1	***Beach Name*** *Little Florida*										
	4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	17	2005	22.0	Routine
	4/11/2011	7:46	Normal	Cloudy	Southwest	Moderate (10-15 mph)	72	2	20	20.0	Routine

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	4/18/2011	7:45	High Tide Falling	Partly Cloudy	Southeast	Moderate (10-15 mph)	74	6.8	1445	32.4	Routine
	4/25/2011	7:45	Normal	Partly Cloudy	South	Strong (20-35 mph)	76	4	207	14.1	Routine
	5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	1652	28.8	Routine
	5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	2	178	22.5	Routine
	5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	76	2	254	29.3	Routine
	5/23/2011	8:00	High Tide Falling	Scattered Clouds	South	Moderate (10-15 mph)	76	2	10	22.4	Routine
	5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	13	1652	17.5	Routine
	6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	4	178	15.9	Routine
	6/13/2011	8:15	Normal	Scattered Clouds	West	Light (0-5 mph)	82	1.8	99	14.2	Routine
	6/20/2011	7:30	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	82	2	178	32.8	Routine
	6/27/2011	8:00	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	82	7.8	1445	13.2	Routine
	7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	2	324	27.8	Routine
	7/11/2011	7:30	Normal	Scattered Clouds	South	Light (0-5 mph)	86	2	111	30.7	Routine
	7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	1.8	124	35.0	Routine
	7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	13	831	35.0	Routine
	8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	2	10	26.3	Routine
	8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	2	53	35.0	Routine
	8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	2	20	35.0	Routine
	8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	2	10	35.0	Routine
	8/29/2011	8:00	Low Tide Falling	Clear	East	Light (0-5 mph)	88	2	10	22.6	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	2	10	32.6	Routine
	9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	2	10	33.0	Routine
	9/19/2011	8:00	Normal	Light Rain	East-Southeast	Light (0-5 mph)	80	13	124	30.7	Routine
	9/26/2011	7:40	Low Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	80	17	53	32.2	Routine
	10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	87	34.2	Routine
	10/10/2011	8:30	Normal	Cloudy	East-Northeast	Moderate (10-15 mph)	76	4.5	164	21.5	Routine
	10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	2	53	28.7	Routine
	10/24/2011	8:00	Low Tide Falling	Scattered Clouds	North	Light (0-5 mph)	75	2	10	31.5	Routine
	10/31/2011	8:30	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	66	2	10	28.7	Routine
Long Beach											
DUNG1	***Beach Name*** *Long Beach*										
	4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	2	2005	21.6	Routine
	4/11/2011	7:46	Normal	Cloudy	Southwest	Moderate (10-15 mph)	72	2	42	17.6	Routine

Beach
Station ID

Date	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
4/18/2011	7:45	High Tide Falling	Partly Cloudy	Southeast	Moderate (10-15 mph)	74	13	1652	32.2	Routine
4/25/2011	7:45	Normal	Partly Cloudy	South	Strong (20-35 mph)	76	2	150	14.5	Routine
5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	2005	27.0	Routine
5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	7.8	111	22.9	Routine
5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	76	2	53	29.3	Routine
5/23/2011	8:00	High Tide Falling	Scattered Clouds	South	Moderate (10-15 mph)	76	2	42	22.4	Routine
5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	4.5	1445	17.9	Routine
6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	21	64	15.6	Routine
6/13/2011	8:15	Normal	Scattered Clouds	West	Light (0-5 mph)	82	7.8	254	14.1	Routine
6/20/2011	7:30	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	82	2	453	32.3	Routine
6/27/2011	8:00	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	82	4.5	1013	13.4	Routine
7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	2	504	28.4	Routine
7/11/2011	7:30	Normal	Scattered Clouds	South	Light (0-5 mph)	86	2	271	30.4	Routine
7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	2	10	35.0	Routine
7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	4	1445	35.0	Routine
8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	2	31	26.2	Routine
8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	2	42	35.0	Routine
8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	2	10	35.0	Routine
8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	2	10	35.0	Routine
8/29/2011	8:00	Low Tide Falling	Clear	East	Light (0-5 mph)	88	2	10	22.9	Routine
9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	4.5	20	32.9	Routine
9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	2	10	32.9	Routine
9/19/2011	8:00	Normal	Light Rain	East-Southeast	Light (0-5 mph)	80	2	53	31.5	Routine
9/26/2011	7:40	Low Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	80	2	31	32.0	Routine
10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	10	34.5	Routine
10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	31	34.3	Field Duplicate
10/10/2011	8:30	Normal	Cloudy	East-Northeast	Moderate (10-15 mph)	76	4.5	20	21.7	Routine
10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	2	20	28.7	Field Split
10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	2	99	28.8	Routine
10/24/2011	8:00	Low Tide Falling	Scattered Clouds	North	Light (0-5 mph)	75	2	31	30.4	Routine
10/31/2011	8:30	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	66	2	10	29.2	Routine

Martin Beach

MART1 ***Beach Name*** *Martin Beach*

Beach
Station ID

Date	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
4/4/2011	7:30	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	23	2005	21.1	Routine
4/11/2011	7:46	Normal	Cloudy	Southwest	Moderate (10-15 mph)	72	2	364	17.4	Routine
4/18/2011	7:45	High Tide Falling	Partly Cloudy	Southeast	Moderate (10-15 mph)	74	4.5	2005	31.7	Routine
4/25/2011	7:45	Normal	Partly Cloudy	South	Strong (20-35 mph)	76	4.5	10	15.1	Routine
5/2/2011	8:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	76	2	2005	25.8	Routine
5/9/2011	7:45	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	76	7.8	384	23.0	Routine
5/16/2011	8:10	Normal	Partly Cloudy	North	Moderate-Light (5-10 mph)	76	2	111	30.0	Routine
5/23/2011	8:00	High Tide Falling	Scattered Clouds	South	Moderate (10-15 mph)	76	2	42	23.1	Routine
5/31/2011	7:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	79	13	2005	18.0	Routine
6/6/2011	7:30	High Tide	Partly Cloudy	West	Light (0-5 mph)	82	13	53	15.1	Routine
6/13/2011	8:15	Normal	Scattered Clouds	West	Light (0-5 mph)	82	1.8	306	14.8	Routine
6/20/2011	7:30	High Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	82	6.8	2005	33.1	Routine
6/27/2011	8:00	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	82	6.8	591	13.6	Routine
7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	2	87	29.0	Field Split
7/5/2011	7:30	High Tide	Scattered Clouds	Calm	Calm (0 mph)	84	11	207	28.9	Routine
7/11/2011	7:30	Normal	Scattered Clouds	South	Light (0-5 mph)	86	11	429	30.6	Routine
7/18/2011	7:40	High Tide	Partly Cloudy	Northwest	Light (0-5 mph)	86	2	20	35.0	Routine
7/25/2011	7:45	High Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	86	17	2005	35.0	Routine
8/1/2011	8:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	88	2	10	27.5	Routine
8/8/2011	8:15	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	86	4.5	20	35.0	Routine
8/15/2011	8:30	Normal	Scattered Clouds	North	Light (0-5 mph)	88	1.8	10	35.0	Routine
8/22/2011	8:00	Normal	Scattered Clouds	Northeast	Light (0-5 mph)	88	2	10	35.0	Routine
8/29/2011	8:00	Low Tide Falling	Clear	East	Light (0-5 mph)	88	2	10	21.4	Routine
9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	78	79	99	31.9	Routine
9/12/2011	7:45	Low Tide Falling	Clear	Southwest	Light (0-5 mph)	80	2	20	32.4	Routine
9/19/2011	8:00	Normal	Light Rain	East-Southeast	Light (0-5 mph)	80	2	10	32.3	Routine
9/26/2011	7:40	Low Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	80	6.1	53	31.7	Routine
10/4/2011	8:45	Normal	Clear	Northeast	Light (0-5 mph)	72	2	10	34.7	Routine
10/10/2011	8:30	Normal	Cloudy	East-Northeast	Moderate (10-15 mph)	76	2	53	21.9	Routine
10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	2	42	28.2	Routine
10/17/2011	8:15	Normal	Scattered Clouds	East	Light (0-5 mph)	76	2	31	28.6	Field Split
10/31/2011	8:30	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	66	2	10	29.7	Routine

North Beach

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
LCNB1	***Beach Name*** *North Beach*										
	4/4/2011	8:23	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	110	31	6.0	Routine
	4/4/2011	8:23	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	170	945	10.3	Routine
	4/11/2011	8:18	Low Tide Falling	Partly Cloudy	Southwest	Moderate-Light (5-10 mph)	72	220	137	8.0	Routine
	4/18/2011	8:15	High Tide Falling	Cloudy	South	Moderate (10-15 mph)	70	49	53	6.9	Field Duplicate
	4/18/2011	8:15	High Tide Falling	Cloudy	South	Moderate (10-15 mph)	70	33	10	7.3	Routine
	4/25/2011	8:22	Low Tide Falling	Cloudy	South	Moderate (10-15 mph)	74	21	10	11.9	Routine
	5/2/2011	8:26	High Tide Falling	Cloudy	South-Southeast	Moderate-Light (5-10 mph)	75	49	10	8.3	Routine
	5/16/2011	8:15	High Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	75	4	10	10.4	Routine
	5/23/2011	8:15	Low Tide Falling	Partly Cloudy	South	Moderate (10-15 mph)	76	17	10	12.6	Routine
	5/31/2011	8:35	High Tide Falling	Partly Cloudy	South	Moderate-Light (5-10 mph)	78	2	75	13.7	Routine
	6/6/2011	8:15	Low Tide	Partly Cloudy	North	Light (0-5 mph)	82	7.8	10	13.3	Routine
	6/13/2011	8:18	High Tide Falling	Partly Cloudy	North-Northeast	Light (0-5 mph)	83	2	20	17.2	Routine
	6/20/2011	8:15	High Tide Falling	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	81	4.5	10	14.6	Routine
	6/27/2011	8:00	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	82	17	31	9.8	Routine
	7/5/2011	8:20	High Tide Falling	Clear	North	Light (0-5 mph)	83	2	10	9.5	Routine
	7/11/2011	8:20	High Tide Falling	Partly Cloudy	North	Light (0-5 mph)	85	2	10	9.9	Routine
	7/18/2011	7:58	High Tide Falling	Partly Cloudy	North	Light (0-5 mph)	85	49	53	10.2	Routine
	7/25/2011	8:20	High Tide Falling	Partly Cloudy	West	Light (0-5 mph)	84	2	10	8.2	Routine
	8/1/2011	8:20	High Tide Falling	Partly Cloudy	Northwest	Moderate-Light (5-10 mph)	85	4.5	10	7.7	Routine
	8/8/2011	8:25	High Tide Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)	83	2	10	7.2	Field Duplicate
	8/8/2011	8:25	High Tide Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)	83	6.8	53	7.4	Routine
	8/15/2011	8:10	Low Tide	Partly Cloudy	North-Northeast	Light (0-5 mph)	82	920	1652	9.0	Routine
	8/22/2011	8:20	High Tide Falling	Clear	Calm	Calm (0 mph)	85	540	53	11.6	Routine
	8/29/2011	8:20	High Tide Falling	Clear	East-Northeast	Light (0-5 mph)	82	4.5	42	17.9	Routine
	9/6/2011	8:20	High Tide Falling	Clear	North-Northwest	Light (0-5 mph)	74	33	207	14.0	Routine
	9/12/2011	8:15	High Tide Falling	Clear	Southeast	Light (0-5 mph)	76	79	20	14.0	Routine
	9/19/2011	8:20	High Tide Falling	Light Rain	South	Moderate-Light (5-10 mph)	76	110	238	16.0	Routine
	9/19/2011	8:20	High Tide Falling	Light Rain	South	Moderate-Light (5-10 mph)	76	49	64	15.9	Field Split
	9/26/2011	8:24	High Tide Falling	Partly Cloudy	South-Southwest	Moderate-Light (5-10 mph)	77	23	75	17.4	Routine
	10/3/2011	8:15	High Tide Falling	Clear	West-Northwest	Light (0-5 mph)	72	22	124	19.5	Routine
	10/10/2011	8:20	High Tide Falling	Cloudy	East	Light (0-5 mph)	72	79	99	24.3	Routine
	10/17/2011	8:05	High Tide Falling	Partly Cloudy	North-Northwest	Light (0-5 mph)	73	13	111	18.2	Routine
	10/24/2011	6:32	High Tide Falling	Partly Cloudy	Variable	Light (0-5 mph)	71	31	42	21.3	Routine

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	10/31/2011	8:20	High Tide Falling	Clear	North	Light (0-5 mph)	66	79	75	22.1	Routine
Pontchartrain Beach											
PONT1	***Beach Name*** *Pontchartrain Beach*										
	4/5/2011	10:15	Low Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	68	350	207	3.8	Routine
	4/12/2011	10:50	Low Tide	Clear	North	Moderate-Strong (15-20 mph)	73.04	49	20	5.1	Routine
	4/12/2011	10:50	Low Tide	Clear	North	Moderate-Strong (15-20 mph)	73	130	10	5.1	Field Duplicate
	4/19/2011	9:30	Normal	Partly Cloudy	South	Moderate (10-15 mph)	73	11	10	4.8	Routine
	4/26/2011	8:30	High Tide Falling	Light Rain	North-Northeast	Moderate (10-15 mph)	76.28	49	99	4.4	Routine
	5/3/2011	9:56	High Tide	Light Rain	North-Northwest	Moderate-Strong (15-20 mph)	75.38	130	324	4.6	Routine
	5/10/2011	9:30	Normal	Partly Cloudy	South-Southwest	Light (0-5 mph)	77	7.8	10	4.8	Routine
	5/17/2011	9:45	High Tide	Scattered Clouds	North	Light (0-5 mph)	70.7	33	87	1.9	Routine
	5/17/2011	9:45	High Tide	Scattered Clouds	North	Light (0-5 mph)	70.7	49	75	1.9	Field Split
	5/24/2011	9:00	High Tide	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	75.56	79	75	0.2	Routine
	5/31/2011	9:40	High Tide	Clear	Northeast	Light (0-5 mph)	78.26	6.8	10	0.5	Routine
	6/7/2011	9:00	Normal	Partly Cloudy	West-Northwest	Moderate-Light (5-10 mph)	84.02	23	42	0.2	Routine
	6/14/2011	9:30	Low Tide	Clear	West	Light (0-5 mph)	85.46	33	10	1.2	Routine
	6/21/2011	6:45	Low Tide	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	84.2	2	10	0.2	Routine
	6/28/2011	9:00	Normal	Partly Cloudy	Northwest	Light (0-5 mph)	85.1	49	10	1.2	Routine
	7/5/2011	9:50	Low Tide	Cloudy	North-Northwest	Light (0-5 mph)	87.44	13	10	1.7	Routine
	7/12/2011	9:00	Normal	Partly Cloudy	North-Northwest	Moderate-Light (5-10 mph)	87.44	23	20	1.7	Routine
	7/19/2011	7:45	Normal	Partly Cloudy	East-Southeast	Light (0-5 mph)	83.84	350	31	1.3	Routine
	7/26/2011	9:50	Low Tide	Partly Cloudy	West-Southwest	Moderate (10-15 mph)	84.2	23	222	1.4	Routine
	8/2/2011	9:45	Normal	Cloudy	West-Northwest	Moderate-Light (5-10 mph)	88.7	9.2	20	1.2	Routine
	8/9/2011	9:50	Low Tide	Mist	West	Moderate (10-15 mph)	87.98	23	20	1.1	Routine
	8/16/2011	8:15	Low Tide	Clear	Calm	Moderate-Light (5-10 mph)	86.54	49	75	0.9	Routine
	8/23/2011	9:00	Normal	Clear	North-Northwest	Moderate-Light (5-10 mph)	88.88	23	31	1.9	Routine
	8/30/2011	9:30	High Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	86.72	13	31	1.9	Routine
	9/6/2011	10:00	High Tide Rising	Scattered Clouds	North	Moderate (10-15 mph)	75.92	1600	2005	1.6	Routine
	9/13/2011	9:30	Low Tide	Clear	West	Moderate-Light (5-10 mph)	78.62	17	10	5.0	Routine
	9/13/2011	9:30	Low Tide	Clear	West	Moderate-Light (5-10 mph)	78.6	11	20	5.0	Field Duplicate
	9/20/2011	9:50	High Tide	Cloudy	Northwest	Moderate-Light (5-10 mph)	79.7	4.5	10	4.7	Routine
	9/27/2011	9:50	Normal	Cloudy	Calm	Calm (0 mph)	81.86	4.5	10	4.3	Routine
	10/4/2011	9:45	Normal	Clear	Northeast	Moderate (10-15 mph)	71.6	2	10	4.0	Routine

Beach / Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero-cocci	Salinity	Sample Type
	10/11/2011	9:30	High Tide	Cloudy	North	Moderate (10-15 mph)	74.12	11	20	4.0	Routine
	10/18/2011	9:45	High Tide Rising	Cloudy	West-Northwest	Moderate-Light (5-10 mph)	76.1	79	42	4.4	Routine
	10/25/2011	9:30	Normal	Clear	Northeast	Moderate-Light (5-10 mph)	68.72	11	31	4.2	Routine
	10/31/2011	8:15	High Tide Falling	Clear	North	Light (0-5 mph)	63.5	13	10	4.2	Routine
Rutherford Beach											
RUTH1	***Beach Name** Rutherford Beach*										
	4/4/2011	10:50	High Tide	Cloudy	South	Moderate-Strong (15-20 mph)	67	13	697	23.6	Routine
	4/11/2011	8:15	Normal	Cloudy	South-Southwest	Moderate-Light (5-10 mph)	67	4	288	9.9	Routine
	4/18/2011	8:25	Low Tide	Cloudy	South	Moderate (10-15 mph)	63	17	2005	32.3	Routine
	4/25/2011	8:15	Low Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	69	1.8	42	9.5	Routine
	5/2/2011	8:10	Low Tide	Partly Cloudy	East-Southeast	Moderate (10-15 mph)	68	2	885	25.6	Routine
	5/9/2011	8:05	Low Tide Falling	Cloudy	South-Southeast	Moderate-Light (5-10 mph)	69	130	306	15.0	Routine
	5/16/2011	8:00	Low Tide Falling	Partly Cloudy	North	Light (0-5 mph)	60	2	429	33.3	Routine
	5/23/2011	8:05	Normal	Scattered Clouds	South-Southeast	Moderate (10-15 mph)	70	4.5	64	15.0	Routine
	5/31/2011	8:05	Normal	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	72	2	111	13.2	Routine
	6/6/2011	8:10	Low Tide	Clear	West-Southwest	Light (0-5 mph)	76	2	124	17.5	Routine
	6/13/2011	8:05	Low Tide	Scattered Clouds	South-Southwest	Light (0-5 mph)	77	13	288	9.4	Routine
	6/20/2011	8:00	Low Tide Falling	Scattered Clouds	South	Moderate-Strong (15-20 mph)	78	7.8	2005	17.8	Routine
	6/27/2011	8:10	Low Tide	Scattered Clouds	South	Light (0-5 mph)	77	7.8	150	5.1	Field Duplicate
	6/27/2011	8:10	Low Tide	Scattered Clouds	South	Light (0-5 mph)	77	23	164	5.3	Routine
	7/5/2011	8:00	Low Tide	Scattered Clouds	Calm	Calm (0 mph)	76	79	1298	24.5	Routine
	7/11/2011	8:00	Low Tide	Scattered Clouds	North	Light (0-5 mph)	80	2	20	22.2	Routine
	7/18/2011	7:55	Low Tide	Cloudy	South	Light (0-5 mph)	77	2	222	30.1	Routine
	7/25/2011	8:00	Low Tide	Cloudy	Southwest	Moderate-Light (5-10 mph)	77	49	111	35.0	Routine
	8/1/2011	8:05	Low Tide	Clear	West-Southwest	Light (0-5 mph)	80	79	87	22.0	Routine
	8/8/2011	8:10	Low Tide	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	80	17	222	35.0	Routine
	8/15/2011	7:55	Low Tide	Clear	Calm	Calm (0 mph)	78	4.5	31	35.0	Routine
	8/22/2011	8:00	Low Tide	Clear	Calm	Calm (0 mph)	80	2	10	35.0	Routine
	8/29/2011	7:55	Low Tide Falling	Clear	East-Northeast	Light (0-5 mph)	80	1.8	31	21.1	Routine
	9/6/2011	8:00	Normal	Clear	North	Light (0-5 mph)	67	49	99	29.1	Routine
	9/12/2011	8:00	Low Tide Falling	Clear	South	Light (0-5 mph)	72	4.5	10	27.7	Routine
	9/19/2011	8:05	Low Tide	Light Rain	Southeast	Light (0-5 mph)	70	1.8	20	32.5	Routine
	9/26/2011	8:05	Low Tide	Partly Cloudy	South-Southwest	Moderate (10-15 mph)	73	2	178	30.3	Routine

Beach / Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero-cocci	Salinity	Sample Type
	10/3/2011	8:10	Low Tide	Clear	North-Northeast	Light (0-5 mph)	60	2	10	31.8	Routine
	10/10/2011	8:00	Normal	Cloudy	East	Light (0-5 mph)	68	7.8	64	18.0	Routine
	10/17/2011	8:15	Low Tide	Scattered Clouds	East	Light (0-5 mph)	67	4.5	87	30.2	Routine
	10/24/2011	8:10	Low Tide Falling	Clear	Calm	Calm (0 mph)	64	4.5	31	31.3	Routine
	10/31/2011	8:20	Low Tide	Clear	Northeast	Light (0-5 mph)	53	2	10	31.6	Routine
South Beach and Rabbit Island											
LCSB1	***Beach Name*** *South Beach and Rabbit Island*										
	4/4/2011	8:23	High Tide Falling	Cloudy	South	Moderate-Strong (15-20 mph)	72	130	945	10.3	Routine
	4/11/2011	8:40	Low Tide Falling	Partly Cloudy	Southwest	Moderate-Light (5-10 mph)	72	4.5	10	11.7	Routine
	4/18/2011	8:15	High Tide Falling	Cloudy	South	Moderate (10-15 mph)		4.5	164	10.7	Routine
	4/25/2011	8:46	Low Tide Falling	Cloudy	South	Moderate (10-15 mph)	74	2	10	14.9	Routine
	5/2/2011	8:26	High Tide Falling	Cloudy	South-Southeast	Moderate-Light (5-10 mph)	75	13	20	12.0	Routine
	5/16/2011	8:15	High Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	75	2	10	11.6	Routine
	5/23/2011	8:15	Low Tide Falling	Partly Cloudy	South	Moderate (10-15 mph)	76	4.5	10	16.4	Routine
	5/31/2011	8:35	High Tide Falling	Partly Cloudy	South	Moderate-Light (5-10 mph)	80	22	53	17.4	Field Duplicate
	5/31/2011	8:35	High Tide Falling	Partly Cloudy	South	Moderate-Light (5-10 mph)	80	4	64	17.4	Routine
	6/6/2011	8:15	Low Tide	Partly Cloudy	North	Light (0-5 mph)	82	2	31	16.5	Routine
	6/13/2011	8:18	High Tide Falling	Partly Cloudy	North-Northeast	Light (0-5 mph)	83	2	10	12.6	Routine
	6/20/2011	8:15	High Tide Falling	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	81	2	20	18.3	Routine
	6/27/2011	8:00	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	82	23	20	14.6	Routine
	7/5/2011	8:20	High Tide Falling	Clear	North	Light (0-5 mph)	84	240	504	13.4	Field Split
	7/5/2011	8:20	High Tide Falling	Clear	North	Light (0-5 mph)	84	79	453	13.2	Routine
	7/11/2011	8:20	High Tide Falling	Partly Cloudy	North	Light (0-5 mph)	85	2	10	13.3	Routine
	7/18/2011	7:58	High Tide Falling	Partly Cloudy	North	Light (0-5 mph)	85	79	137	13.5	Routine
	7/25/2011	8:20	High Tide Falling	Partly Cloudy	West	Light (0-5 mph)	83	2	75	13.1	Routine
	8/1/2011	8:20	High Tide Falling	Partly Cloudy	Northwest	Moderate-Light (5-10 mph)	84	11	64	11.1	Routine
	8/8/2011	8:25	High Tide Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	2	20	12.8	Routine
	8/15/2011	8:10	Low Tide	Partly Cloudy	North-Northeast	Light (0-5 mph)	83	1600	885	14.1	Routine
	8/22/2011	8:20	High Tide Falling	Clear	Calm	Calm (0 mph)	85	17	53	16.3	Routine
	8/29/2011	8:20	High Tide Falling	Clear	East-Northeast	Light (0-5 mph)	83	2	111	23.0	Routine
	9/6/2011	8:20	High Tide Falling	Clear	North-Northwest	Light (0-5 mph)	74	79	1091	17.1	Routine
	9/6/2011	8:20	High Tide Falling	Clear	North-Northwest	Light (0-5 mph)	74	33	1184	17.5	Field Split
	9/12/2011	8:15	High Tide Falling	Clear	Southeast	Light (0-5 mph)	77	350	99	20.4	Routine

Beach *Station ID*	*Date*	*Time*	*Tide*	*Weather*	*Wind Direction*	*Wind Speed*	*Water Temp*	*Fecal Coliform*	*Entero-cocci*	*Salinity*	*Sample Type*
	9/19/2011	8:20	High Tide Falling	Light Rain	South	Moderate-Light (5-10 mph)	77	130	591	18.5	Routine
	9/26/2011	8:24	High Tide Falling	Partly Cloudy	South-Southwest	Moderate-Light (5-10 mph)	78	13	164	20.2	Routine
	9/26/2011	8:24	High Tide Falling	Partly Cloudy	South-Southwest	Moderate-Light (5-10 mph)	78	7.8	238	20.4	Field Split
	10/3/2011	8:15	High Tide Falling	Clear	West-Northwest	Light (0-5 mph)	72	2	42	21.8	Field Duplicate
	10/3/2011	8:15	High Tide Falling	Clear	West-Northwest	Light (0-5 mph)	72	2	10	21.3	Routine
	10/10/2011	8:20	High Tide Falling	Cloudy	East	Light (0-5 mph)	73	2	31	25.0	Routine
	10/17/2011	8:05	High Tide Falling	Partly Cloudy	North-Northwest	Light (0-5 mph)	74	2	178	23.8	Routine
	10/24/2011	6:32	High Tide Falling	Partly Cloudy	Variable	Light (0-5 mph)	70	4.5	87	25.0	Field Split
	10/24/2011	6:32	High Tide Falling	Partly Cloudy	Variable	Light (0-5 mph)	70	1.8	99	24.6	Routine
	10/31/2011	8:20	High Tide Falling	Clear	North	Light (0-5 mph)	66	7.8	10	21.0	Routine

APPENDIX D

Summary of Louisiana BEACH Program's Fulfillment of U.S. EPA's BEACH Grant Requirements

Summary of Louisiana BEACH Program's Fulfillment of U.S. EPA's BEACH Grant Requirements

U.S. EPA established nine performance criteria that eligible coastal or Great Lakes state, tribal, or local governments must meet to receive grants to implement coastal recreation water monitoring and public notification programs under the BEACH Act. Those criteria, together with a brief summary how Louisiana has fulfilled each, are provided below.

Category	Performance Criterion	Louisiana's Fulfillment of Criterion
Evaluation and Classification	1. Develop risk-based beach evaluation and classification plan	Identification of factors used to evaluate and rank beaches are provided in Chapter 2 of the *Louisiana's BEACH Grant Final Report, Grant Year 2001* (the "Initial BEACH Report"; LDHH, 2003). More specifically: • Coastal recreation waters are identified in Section 2.1. • Beaches used by the public for water contact activities within coastal recreation waters are identified in Section 2.2. • The original information describing (1) the potential risk to human health presented by pathogens and (2) the use of the beaches is provided in Sections 2.3-2.4 of the Initial Report. Information on the prior year's water quality and projected level of use for each beach monitored under the Program are provided in Chapter 2 of the Program's annual report. • EPA is notified annually of any change in beach rankings and other program changes in Chapter 2 of the Program's annual report.
Monitoring	2. Develop tiered monitoring plan	• Chapter 3 of the Initial BEACH Report describes the Program's monitoring plan, addressing the frequency and location of monitoring, and assessment criteria. • Chapter 2 of the Initial BEACH Report describes periods of recreational use of the waters, and nature and extent of use during certain periods. • Sample stations were established based on spatial use patterns as described in Chapter 2 of the Initial BEACH Report, adjusted for the proximity to known point and nonpoint sources of pollution. • Section 3.1 of the Initial BEACH Report outlines the Program's quality control plan, which is described more completely in the Program's current Quality Assurance Project Plan (QAPP).
	3. Monitoring report submission and delegation	The Program reports monitoring data to the public, EPA, and other agencies through timely annual submission of those data to EPA's STORET database. Additionally, the full dataset and summaries are provided in the Program's Annual Report.

	4. Methods and assessment procedures	Methods for detecting levels of pathogen indicators in coastal recreation areas are described in Section 3.3 of the Initial BEACH Report and the QAPP.
Public Notification and Prompt Risk Communication	5. Public notification and risk communication plan	Measures to notify the public, EPA and local governments when indicator bacteria levels exceed a water quality standard are provided in Chapter 4 of the Initial BEACH Report.
	6. Measures to notify EPA and local governments	Measures to notify local governments and EPA when water quality standards are exceeded are provided in Chapter 4 of the Initial BEACH Report. The Program submits notification data and actions taken to notify the public to EPA's PRAWN database annually.
	7. Measures to notify the public	Measures to notify the public when water quality standards are exceeded are provided in Chapter 4 of the Initial BEACH Report. Upon observing an exceedance of water quality criteria, the Program immediately issues a public notification or resamples for bacterial exceedance of a water quality standard in accordance with the QAPP. The notification is placed on the Program's website, disseminated to the media, and signs posted at each station are changed to indicate that an advisory is in effect.
	8. Notification report submission and delegation	• EPA and local governments are notified annually of any notification plan changes and any delegation of responsibilities in the Program's annual work plan. • The Program reports actions taken to notify the public when water quality standards are exceeded in its annual PRAWN submission and in the Program's annual report.
Public Evaluation	9. Public evaluation of program	The Initial Beach Report and all subsequent annual reports have been made available to the public for review and comment. The Program publishes a public notice informing the public of the availability of the annual report and the duration of the comment period, and the report is made available on the Program's website.